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REMOVAL ACTION REPORT

Anderson-Calhoun Mine/Mill Site
Leadpoint, Washington

Contract No. 68-SO-1-03
TDD 02-10-0006

Prepared for

U.S. Environmental Protection Agency, Region 10

10000217

March 2003

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Prepared for

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Contents

List of Abbreviations and Acronyms v

Introduction 1

Site Conditions and Background 3

- Site Location 3
- Site Description 3
- Site Background 11
- Previous Investigations 11
  - 2001 Site Investigation 11
  - 2002 Removal Evaluation 12
  - 2002 USFWS Site Visit 14
- Organization of the Removal Action 14

Removal Action Activities 17

- Decision Areas 17
- Decision Area 1: Drums and Containers 17
  - Mill Building 17
  - Areas Southeast of Mill Building and Former Dry Room 18
  - Debris Pile 23
  - Former Wooden Shed Platform and Maintenance Repair Shop Pad 23
  - Ponds, Drum Storage Rack, and Hopper Area 23
- Decision Area 2: Underground Storage Tank 24
- Decision Area 3: Transformers and Other Electrical Equipment 27
- Decision Area 4: Assay Lab Dump Site 35
- Decision Area 5: White Crystalline Waste Piles 36
- Daily Activities 36
- Interview—(b) (6) 42

Sample Collection and Analytical Results 45

- Decision Area 1—Drums and Containers 46
- Decision Area 2—Underground Storage Tank 46
- Decision Area 3—Transformers and Other Electrical Equipment 48
- Decision Area 4—Assay Lab Dump Site 49
- Decision Area 5—White Crystalline Waste Piles 50
- X-ray Fluorescence Screening and Results 52
- Transformer T21 Spill Incident 53

Materials and Disposal 55

- Potentially Responsible Party Search 59
- Health and Safety 59
- Resources Committed 60

Difficulties Encountered 61

Conclusions 63

References 67

Appendix A Waste Stream Inventories—Drums and Containers
Appendix B Waste Stream Inventories—Transformers and Other Electrical Equipment
Appendix C OSC Pollution Report
Appendix D Hazard Categorization Data Collection Sheets
Appendix E Laboratory Analytical Results and Data Validation
Appendix F FPXRF Screening Data Collection Sheets
Appendix G Waste Disposal Manifest Tickets
Appendix H Photographic Documentation
Appendix I Confidential Enforcement Addendum

Tables

Table 1. Organization of Removal Action, Anderson-Calhoun Mine/Mill site, Leadpoint, Washington. 15

Table 2. Summary of drums and containers observed at the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 24

Table 3. Summary of transformers and other electrical equipment observed at the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 35

Table 4. Laboratory analysis summary for product and oil samples collected at the Anderson-Calhoun Mine/Mill site. 45

Table 5. Field hazard categorization and analytical results for the drums and containers at the Anderson-Calhoun Mine/Mill site. 47

Table 6. TPH analytical results of product samples (mg/kg) collected from the 10,000-gallon underground storage tank, Anderson-Calhoun Mine/Mill site, Leadpoint, Washington. 48

Table 7. PCB results of oil (mg/kg) collected from transformers and other electrical equipment at the Anderson-Calhoun Mine/Mill site. 49

Table 8. Summary of bottles and jars collected at the assay lab dump site, Anderson-Calhoun Mine/Mill site, Leadpoint, Washington. 50

Table 9. Acid testing observations of samples B1, B2, and B3 collected from white crystalline waste piles at the Anderson-Calhoun Mine/Mill site. 51

Table 10. Metals, sulfate, and carbonate results of samples B1, B2, and B3 collected from white crystalline waste piles at the Anderson-Calhoun Mine/Mill site. . . . 51

Table 11. Summary of FPXRF screening results at the Anderson-Calhoun Mine/Mill site (mg/kg). 53

Table 12. PCB and TPH results of confirmation oil and soil samples (mg/kg) collected from transformers T19, T20, and T21, and the T21 spill site, Anderson-Calhoun Mine/Mill site. 54

Table 13. Waste disposal summary for the Anderson-Calhoun Mine/Mill Removal Action located in Leadpoint, Washington. 56

Figures

Figure 1. Vicinity map of the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 4

Figure 2. Site map and property boundaries of the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 5

Figure 3. 1995 aerial photograph of the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 7

Figure 4. Site map, Anderson-Calhoun Mine/Mill site, Leadpoint, Washington. 9

Figure 5. Drums, containers, and confirmation sample locations, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 19

Figure 6. View of the main drum staging area located inside the northeast corner of the mill building, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. . . . 21

Figure 7. Panoramic view of the mill site, including the wooden shed platform (center foreground), the mill building (upper right background), and the hill top with the portal/shaft on top just east (left) of the mill building, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 25

Figure 8. Locations of transformers and other oil-filled electrical equipment, Anderson-Calhoun Mine/Mill site, Leadpoint, Washington. 29

Figure 9. View of three transformers on a pole-mounted platform (later designated as T19, T20, and T21), view from the upper hopper area looking to the southwest, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 31

Figure 10. Oil-filled electrical equipment including switches and circuit breakers located in the lower hopper/primary crusher area, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington. 33

List of Abbreviations and Acronyms

AST	aboveground storage tank
AZLS	American Lead & Zinc Smelting Company
bgs	Below Ground Surface
BTU	British thermal unit
CO_2	carbon dioxide
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
DOT	Department of Transportation
Ecology	Washington State Department of Ecology
E&E	Ecology & Environment, Inc.
EQM	Environmental Quality Management, Inc.
ERI	Environmental Reclamation, Inc.
ERRS	Emergency and Rapid Response Services
FPXRF	field portable x-ray fluorescence
H_2SO_4	sulfuric acid
Herrera	Herrera Environmental Consultants
HCl	hydrochloric acid
KVA	kilovolt amps
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
OSC	On-Scene Coordinator
MTCA	Model Toxics Control Act
NPL	National Priorities List
ppm	parts per million
PCBs	Polychlorinated biphenyls
PQL	Practical Quantitation Limit
PRP	Potentially Responsible Party
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SCBA	Self-contained breathing apparatus
SQAP	Sampling and Quality Assurance Plan
START	Superfund Technical Assessment and Response Team
SVOCs	Semi-volatile Organic Compounds
TAL	Target Analyte List
TPH	Total Petroleum Hydrocarbons

TDD	Technical Direction Document
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
U.S. EPA	United States Environmental Protection Agency
UST	underground storage tank
VOCs	Volatile organic compounds

Introduction

The U.S. Environmental Protection Agency (U.S. EPA) tasked the Herrera Environmental Consultants Inc. (Herrera) Superfund Technical Assessment and Response Team (START) under Technical Direction Document (TDD) 02-10-0006 to conduct oversight of a time critical fund-lead removal action at the former Anderson-Calhoun lead and zinc mine and mill processing plant in Leadpoint, Washington. On October 27, 2002, the START, U.S. EPA, and Emergency and Rapid Response Services (ERRS) contractors, Environmental Quality Management, Inc. (EQM) and Environmental Reclamation, Inc. (ERI), mobilized to the Anderson-Calhoun Mine/Mill site to conduct removal activities.

A preliminary site assessment conducted in September 2001 and a removal site evaluation conducted in September 2002 by the U.S. EPA identified numerous drums and containers across the site, as well as a large number of transformers and other electrical equipment. The site was not secured, and there was widespread evidence of trespassing, vandalism, and domestic and wild animal movement. The following objectives were developed for the site: mitigate exposure to mine-waste contaminated soils; mitigate exposure to PCBs through removal and off-site disposal of the transformers and other oil-filled electrical equipment; and mitigate exposure to other potentially hazardous substances through appropriate characterization and disposal.

The removal action was conducted from October 27, 2002 through November 3, 2002. During this time, the START documented site activities in field logbooks and with video tape and 35-millimeter photographs, conducted oversight of field hazard categorization analysis, conducted health and safety monitoring for on-site workers, conducted field screening for metal concentrations by field portable x-ray fluorescence (FPXRF), and collected samples from drums, containers, and transformers for confirmation analysis based on field hazard categorization results.

Site Conditions and Background

Site Location

The Anderson-Calhoun Mine/Mill is a former lead and zinc mine and mill processing plant located approximately ½ mile west-northwest of the former town of Leadpoint and approximately 35 miles northeast of Colville in Stevens County, Washington (Figure 1). The mine/mill property is situated within the western three-quarters of section 2, the eastern half of section 3, portions of the northern half of section 10, and the northwest quarter of section 11, township 39 north, range 41 east of the Willamette meridian in Stevens County, Washington (Figure 2; 48° 55' 9.84" N, 117° 35' 28.7" W) (USEPA 2002; Valley Title Co. 2002). The property is bounded by rural farm and ranch lands to the north and south, by Lime Creek Mountain to the west, and ranch lands, wooded areas, and Deep Lake-Boundary Road to the east.

The U.S. EPA Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) identification number for the Anderson-Calhoun Mine/Mill site is WAN001002309. The site is not listed on the National Priorities List (NPL) nor is it proposed for the NPL (USEPA 2002).

Site Description

Mine and mill operations at the Anderson-Calhoun Mine/Mill site were located south of the water-filled lower mine pit at the west end of the main road access (Calhoun Mine Road), which intersects Deep Lake-Boundary Road at the northeast corner of the property (Figure 3). Evaporation and settlement ponds contained by berms constructed of waste rock material and tailing piles left over from the mill process are located on the valley floor east of the site and south of Calhoun Mine Road. Most of the operational structures within the site were demolished, with building concrete foundation pads remaining in-place for the electrical room, the dry room (mine workers locker room), two equipment warehouses, an office and assay lab, the engineer's office, the maintenance and repair shop, the wooden storage shed, the bag house, and the truck scale (Figure 4; McNinch 2002). The remaining intact structures included the mill building, the hopper (upper and lower) and primary crusher building, the secondary crusher building, the electrical substation, the first aid room, remnants of a conveyor belt system, the portal and shaft, the silo, and the powder house (Figure 4; McNinch 2002). Other site features include an estimated 10,000-gallon underground storage tank and drum storage rack, both located north of the mill building along the main road to the site.

The mill building was the largest structure on-site, 50 feet wide, 75 feet long, and 40 feet high (E&E 2002). The building was located west and adjacent to the base of a hill approximately 80 feet high, with a portal and shaft hopper connected to the mill by a conveyor belt. The mill consisted of several crushers, ball mills, flotation tanks, and filtering discs.

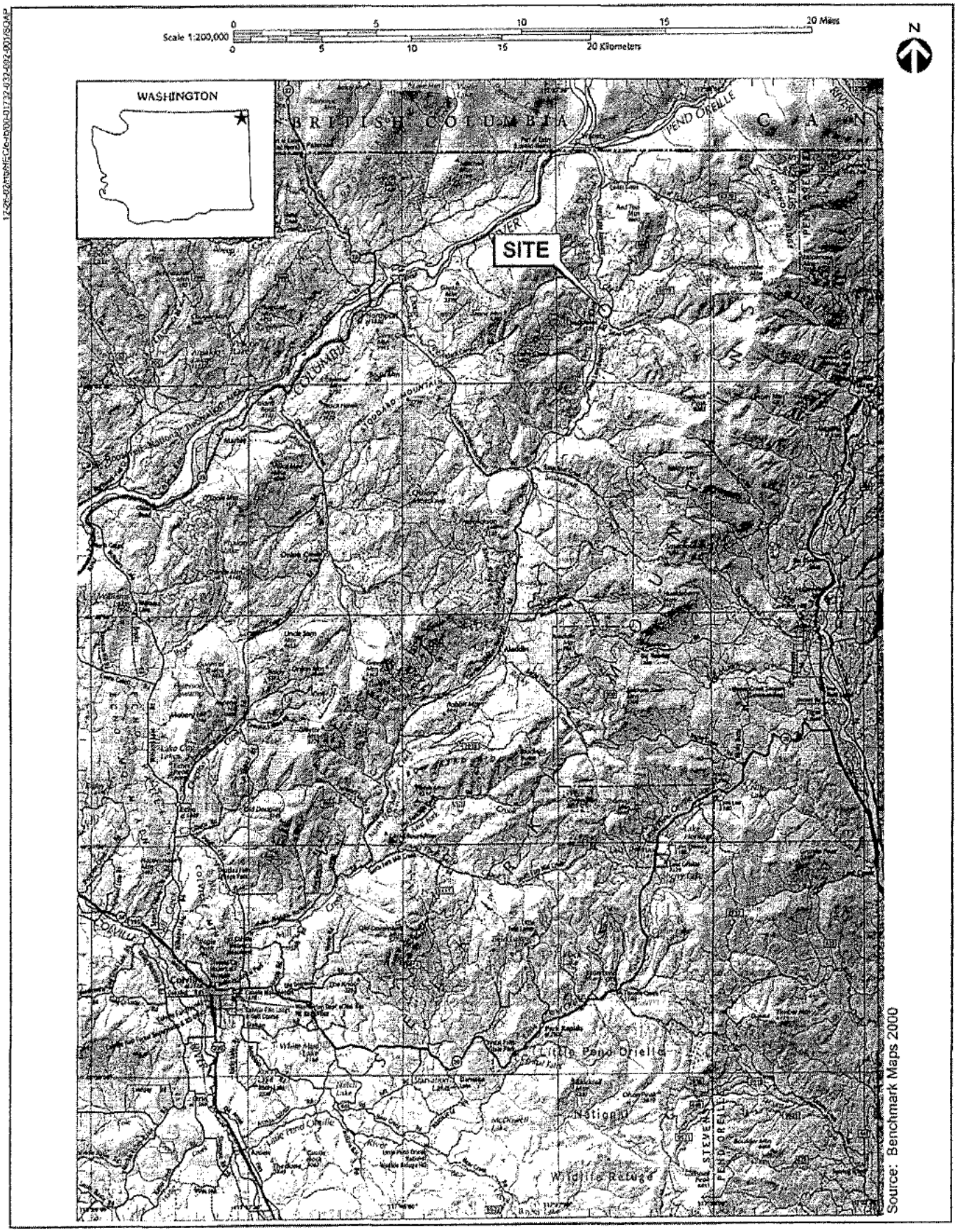

Figure 1. Vicinity map of the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

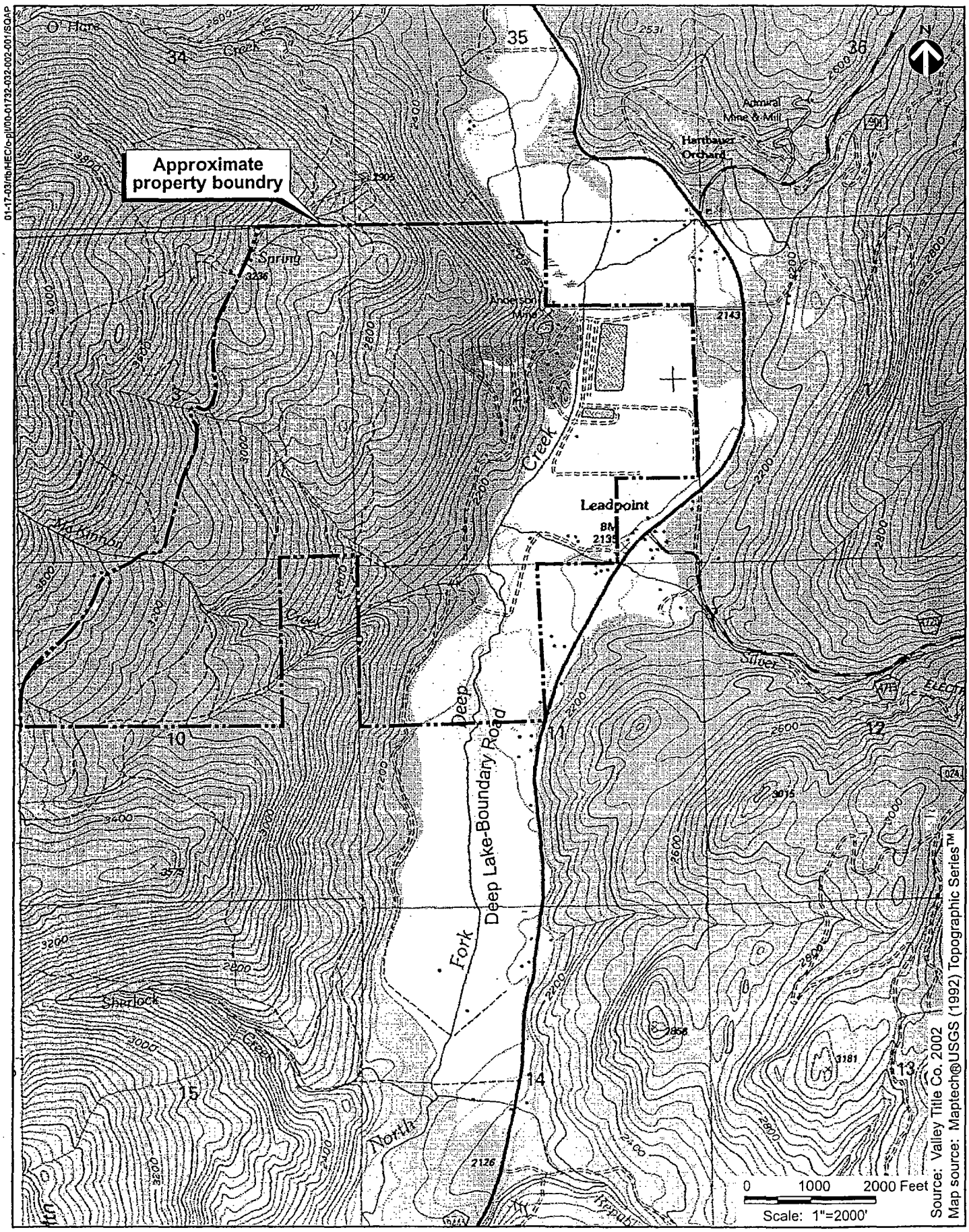

Figure 2. Site map and property boundaries of the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

Figure 3. 1995 aerial photograph of the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

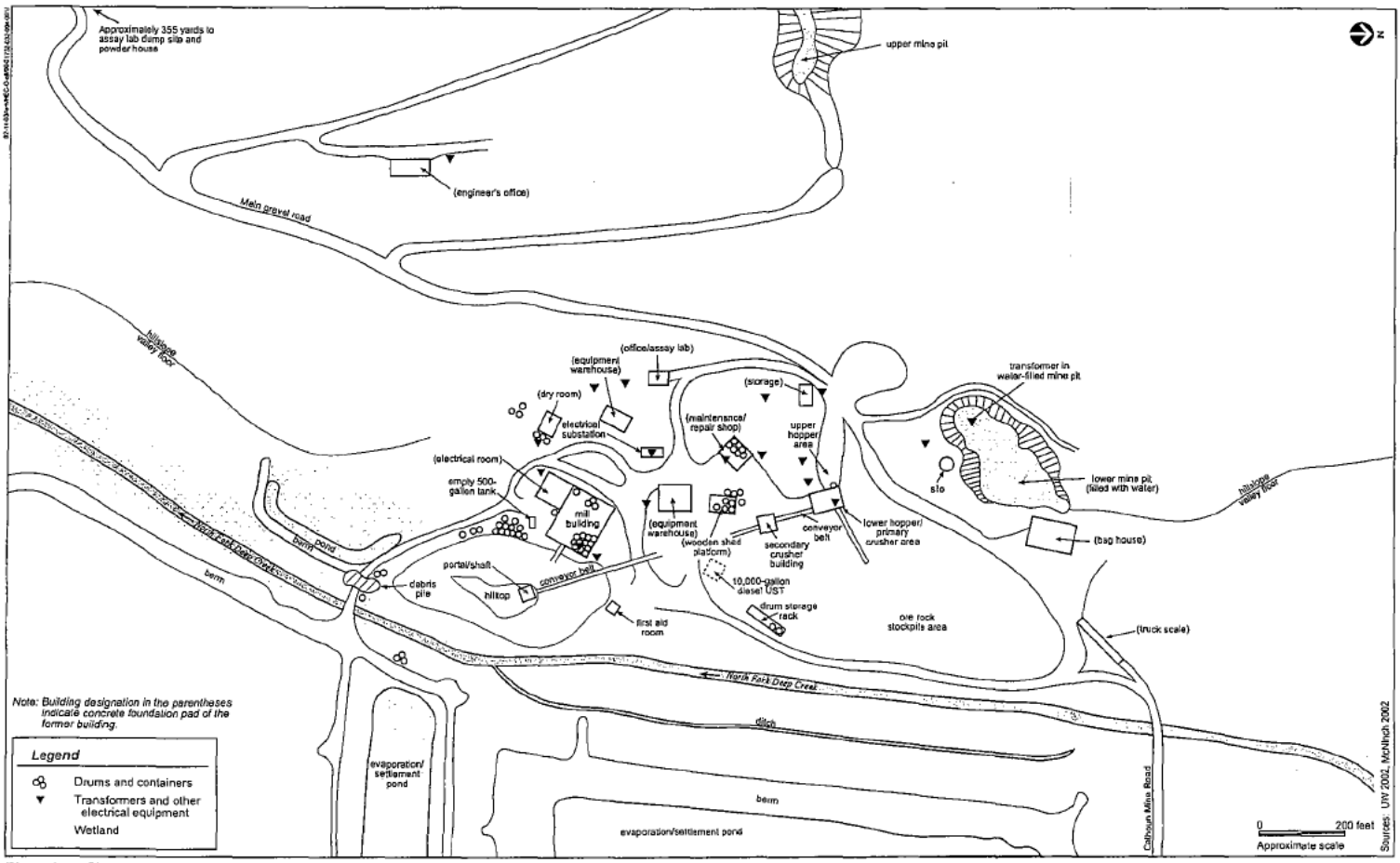

Figure 4. Site map, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

North Fork Deep Creek flows south through the entire length of the site onto private farm and ranch lands. A marshy wetland exists east of the stream and adjacent to the western side of the bermed evaporation/settlement ponds.

Site Background

Andy Anderson discovered lead and zinc mineralization at the site in 1910, exploring with shallow pits and trenches. Between World War II and the early 1960s, several mining companies acquired the site and drilled various portions of the ore body, including an open-pit in the area prospected earlier by Anderson, as well as conducting other mechanized mining development. In the mid 1960s, a 1,200 ton flotation mill for zinc, lead, and silver was built. Another mill, shops, and warehouses also were constructed. The mine/mill operated until 1968-1969. Ownership and land use of the mine/mill property between its closure and the early 1980s is unknown. In the early 1980s, the mill operation was converted into a barite processor for drying and processing barite ore mined from the Flagstaff Mountain area located west of Lake Roosevelt, approximately 3 miles southwest of Northport, Washington. The barite ore was hauled to the mine/mill site for processing; the end product was shipped by rail to be marketed in Alberta, Canada (Gregory personal communication 2002). Barite processing end products are unknown, as well as the processing period. In the mid 1990s, Stevens County involuntarily acquired the mine/mill property due to tax delinquency (USEPA 2002). Since the mid to late 1990s, the site has been left abandoned.

Previous Investigations

This section summarizes the results of a September 2001 site investigation (E&E 2002) and a September 2002 removal evaluation conducted by the U.S. EPA and their contractors (USEPA 2002).

2001 Site Investigation

In September 2001, a site investigation was conducted at the Anderson-Calhoun Mine/Mill site by the U.S. EPA under TDD 01-02-0028. The site investigation included collection of seven surface soil samples within the tailing piles and two stained soil areas, four sediment samples adjacent to the evaporation/settlement ponds and ditch, and one surface water sample from the water-filled lower mine pit. All samples were analyzed for target analyte listed (TAL) metals; four surface soil samples collected within the two stained areas also were analyzed for pesticides and PCBs. Concentrations of lead (2,130 and 2,190 milligrams per kilogram [mg/kg]) and cadmium (124 and 129 mg/kg) in two surface soil samples collected near the wooden shed platform exceeded Model Toxics Control Act (MTCA) method A soil cleanup criteria for unrestricted land use (250 mg/kg for lead and 2 mg/kg for cadmium), as well as for industrial properties (1,000 mg/kg for lead and 2 mg/kg for cadmium). Other metal concentrations elevated above background levels in the same samples included barium, chromium, cobalt, copper,

mercury, silver, and zinc; however, concentrations were detected below established cleanup criteria. The five remaining surface soil samples had 18 of 19 metal concentrations detected either below established cleanup criteria or comparable to background levels (determined from a surface soil sample collected above the mine/mill site). No pesticides or PCBs were detected in four near-surface soil samples collected within two stained soil areas at the site.

2002 Removal Evaluation

In September 2002, U.S. EPA conducted a removal site evaluation to determine whether site conditions warranted a removal action. Observations of site conditions included:

- Eighteen electrical transformers and other oil-filled electrical equipment were identified across the mine/mill site. One transformer was labeled PCB-contaminated (greater than 50 parts per million [ppm] PCBs), several transformers were marked non-PCB (less than 50 ppm PCBs), and others were unmarked. In most instances, transformers and other electrical equipment appeared to be intact. Several transformers were staged on concrete pads, while others were pole-mounted or were on the ground still attached to a pole.

- Approximately 100 55-gallon drums were identified across the mine/mill site. Several drums found out-of-doors appeared empty, while others were filled or partially filled with unknown liquid and/or solid substances. Numerous drums staged inside the dilapidated mill building were punctured with bullets and gelatinous or solid materials had spilled onto the concrete foundation. Several drums were labeled sodium hydroxide or corrosives. Many of the drums were field tested and found to exhibit corrosive, flammable, or ignitable characteristics.

- A partially filled bunkered underground storage tank was identified near the evaporation/settlement pond. The tank capacity was estimated to be 10,000 gallons and the contents were suspected to be diesel and perhaps other materials.

- The site was not secured, with widespread evidence of trespassing, vandalism, and domestic and wild animal movement.

- The presence of a wetland complex with evidence of deer, waterfowl, and amphibians was observed at the site.

Based on these observations, the following conclusions were made by the U.S. EPA supporting the concern that actual or threatened releases of hazardous substances from the site may present an imminent and substantial endangerment to public health or the environment, which triggered a time-critical removal action at the Anderson-Calhoun Mine/Mill site (USEPA 2002):

- The widespread evidence of trespassing (pedestrian footprints, spent ammunition cartridges, and vehicle tracks) and vandalism (bullet punctured drums, damaged equipment and structures) indicated that the human exposure pathway existed. Cadmium, lead, and PCBs were identified at the site and have known or suspected carcinogenic health effects to exposure for humans.

- Observations of deer, waterfowl, and amphibians, cattle, wild animals, and wildlife within the wetland area indicated that an ecological exposure pathway existed. Cadmium, lead, and PCBs were identified at the site with known or suspected carcinogenic health effects to ecological receptors through direct contact and ingestion.

- Surface soils at various locations across the site contained cadmium and lead at concentrations exceeding MTCA method A cleanup criteria for unrestricted land use. The potential existed for contaminated soil to be dispersed beyond the site by pedestrian and/or vehicle traffic.

- Nearby wetland areas could be contaminated if trespassers or recreationists were to vandalize the site, and dispose on-site liquid or solid materials into the nearby wetland complex.

- Warmer temperatures and dry weather typical during summer and fall months would contribute to wind-borne dispersal of mine waste, PCBs, and other potential contaminants. During spring snow melt, rainfall, or other forms of runoff inducing events could spread contaminants offsite.

- Transformers and other oil-filled electrical equipment, many of the 55-gallon drums, and the underground storage tank were susceptible to the threat of fire or explosion because of content characteristics (i.e., flammable and ignitable) and potential acts of vandalism due to unrestricted site access.

- Evidence of trespassing and vandalism indicated the potential for uncontrolled release of PCB-contaminated dielectric oil to the environment as a result of unauthorized salvage of copper cores within transformers and other electrical equipment for recovery as scrap metal sale.

- Exposed 55-gallon drums were susceptible to continued structural degradation and uncontrolled loss of contents. The underground storage tank of unknown contents, construction, and integrity was susceptible to structural degradation due to exposure to the environment.

- Stevens County involuntarily acquired ownership of the property through tax delinquency and is not believed to have caused nor contributed to the release or threatened release of hazardous substances to the site.

2002 USFWS Site Visit

The U.S. Fish and Wildlife Service (USFWS) visited the Anderson-Calhoun Mine and Mill site as part of the removal pre-planning activity. USFWS representatives were supportive of the scope and proposed response action and expressed concern for potential ecological issues which may be associated with the site, particularly the nearby wetland complex.

Organization of the Removal Action

Removal action activities conducted at the Anderson-Calhoun Mine/Mill site consisted of:

- Bulking, transporting, and disposing of unknown hazardous substances in drums and containers, and
- Bulking, transporting, and disposing of oil potentially contaminated with PCBs from transformers and other electrical equipment.

Table 1 outlines the agencies or parties that provided removal action or disposal assistance, and the action(s) each took or role(s) each served.

Table 1. Organization of Removal Action, Anderson-Calhoun Mine/Mill site, Leadpoint, Washington.

Agencies or Parties Involved	Contact	Descriptions of Participation
U.S. EPA – Coeur d'Alene Field Office 1910 Northwest Boulevard, Suite 208 Coeur d'Alene, Idaho 83814 (208) 664-4858	Earl Liverman	Federal On-Scene Coordinator (OSC) responsible for overall response oversight.
U.S. EPA – Region 10 1200 Sixth Avenue Seattle, Washington 98101 (206) 553-4972	Jed Januch	Issued written Notice Letters and Request for Information Letters to potentially responsible parties
Herrera Environmental Consultants, Inc. START 2200 Sixth Avenue, Suite 1100 Seattle, Washington 98121 (206) 441-9080	Peter Jowise Diana Phelan David Brown Laura Jones-Lofink Paula Fedirchuk	Provided the OSC with technical assistance, administrative support, sampling, video, photo, and site documentation, site safety, and report preparation. Provided self-contained breathing apparatus (SCBAs) to ERRS for use during hazard categorization analysis of drums.
Environmental Quality Management, Inc. (EQM) ERRS 6825 216th Street SW, Suite #A Lynnwood, Washington 98036 (425) 673-2900	Ron McManamy Steve Mitchell Jason Coury	Provided personnel and equipment necessary for and conducted the cleanup. Coordinated transportation and disposal of materials.
Environmental Reclamation, Inc. (ERI) ERRS Subsidiary of Enviro-Energy Corp. of Spokane, WA (208) 556-6384	Kip McGillvray	Primary operating subcontractor for EQM. Provided personnel and equipment necessary for and conducted the cleanup. Conducted hazard categorization analysis on drums and containers.
Philip Environmental Services, Inc. (800) 228-7872	Kellie Vigil	Provided offsite transport of materials for treatment and disposal.
North Creek Analytical, Inc. East 11115 Montgomery, Suite B Spokane, Washington 99206 (509) 924-9200	Dennis Wells	Provided laboratory analytical services for confirmation samples.

Removal Action Activities

A Removal Action was conducted to mitigate potential releases of hazardous substances to the environment. Hazardous substances were identified at several locations on-site during previous investigations, with potential risk to human health and the environment through accidental or intentional release (E&E 2002; USEPA 2002). The Anderson-Calhoun Mine/Mill Removal Action activities were conducted from October 27 to November 3, 2002 under the authority of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The START documented site conditions of Removal Action activities using field logbooks, a 35-millimeter camera, and a video camera. The waste stream inventories for drums and containers are provided in Appendix A and for transformers and other oil-filled electrical equipment in Appendix B. The Pollution Report for the Anderson-Calhoun Mine/Mill Removal Action prepared by the OSC is attached in Appendix C. A data summary of hazard categorization analysis and results conducted by ERRS on drums identified and inventoried by START are provided in Appendix D.

Decision Areas

Decision Areas were designated as sections of the site segregated for convenience of conducting independent removal action activities. Five Decision Areas were designated: drums and containers, the underground storage tank, transformers and other electrical equipment, the assay lab dump site, and white crystalline waste piles.

Decision Area 1: Drums and Containers

The following observations and hazard categorization results were collected from drums and containers located across the mine/mill site (Figure 5). Decision Area 1 was further segregated based on contaminants of concern and physical setting.

Descriptions of container types and their characteristics are provided on the inventory sheets in Appendix A. Total capacity of drums and containers stated throughout this section was based on field observations during inventory; waste content volume was determined during removal. In general, only containers holding potentially hazardous material were numbered; however, in some cases empty drums and containers were given identification numbers. Drums and containers were marked and inventoried in accordance with the Anderson-Calhoun Mine/Mill Removal Action Sampling and Quality Assurance Plan (Herrera 2002).

Mill Building

The largest numbers of drums observed on-site were those staged together on the first floor inside the northeast corner of the mill building (also referred to as the main drum staging area,

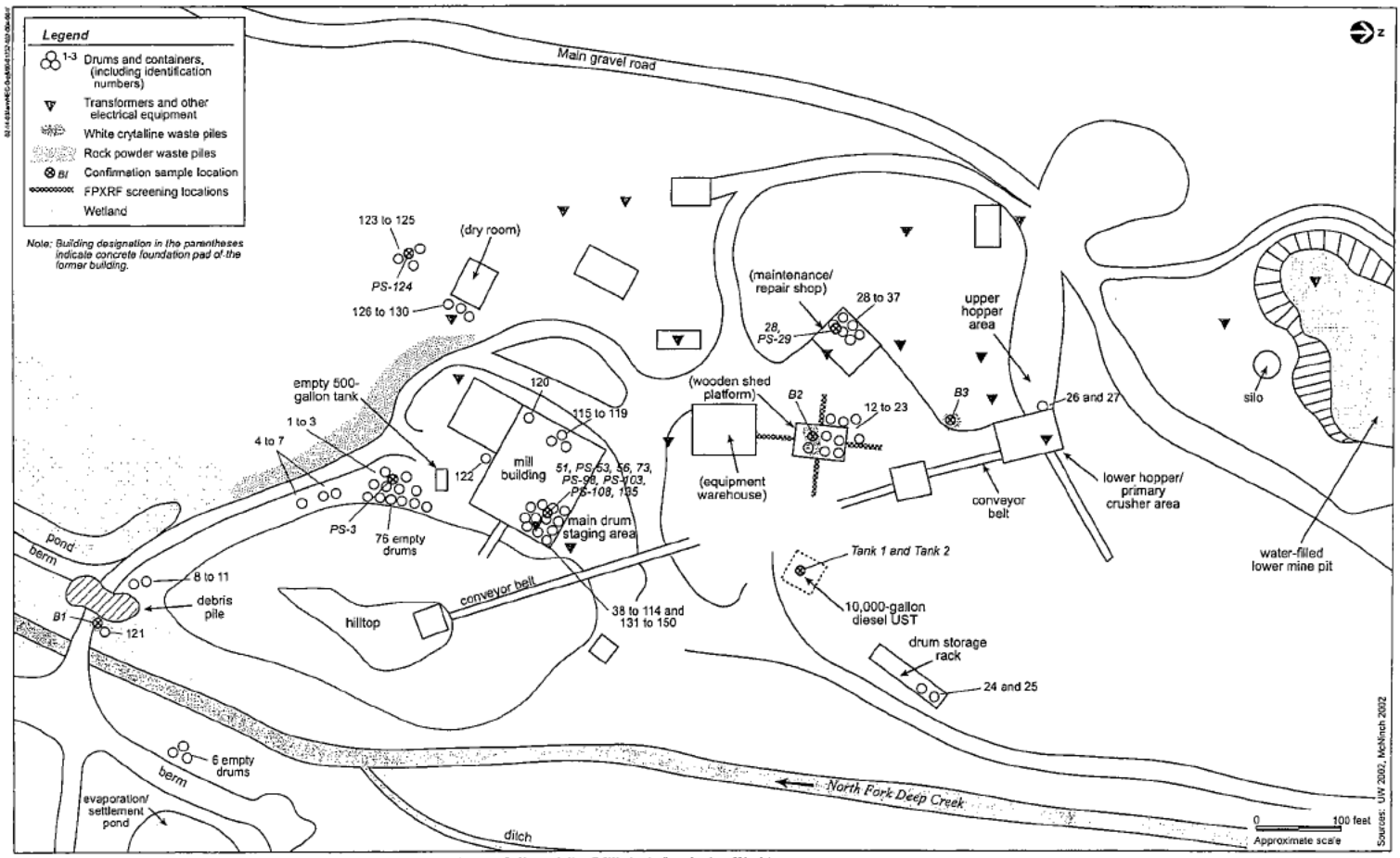

Figure 5. Drums, containers, and confirmation sample locations, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

Figure 6). Many of the drums were punctured by bullets, with contents released and solidified onto the concrete foundation. Several auction ticket labels associated with the James G. Murphy, Inc. Auctioneers were noted affixed to various ball mills and other mill processing equipment, as well as on one of the 55-gallon drums (drum #77) staged among a large center grouping of drums at the northeast corner of the building.

A total of 98 55-gallon drums were observed staged together on the first floor (#38 through #115 and #131 through #150). In general, most of the drums contained like substances identified either by labels and container type or from hazard categorization results including six sodium hydroxide powder (#40 through #45), eight liquid base material labeled "Aero-Promoter" (#91 through #97), and seventeen flammable liquid material including eight drums labeled "Super Floc 1" (#98 through #114). The largest number of drums in the center of the main staging area contained a liquid base material solidified due to cold temperatures identified by labels as "silicate of soda" (#32 through #90 and #131 through #150). Most of the perimeter drums (#32 through #90) were punctured by bullets, with contents released and solidified on the concrete floor. Drums located in the center of the group (#131 through #150) were full of silicate of soda. The 17 remaining drums included five flammable liquids (#38, #39, #47, #53, and #54), three frozen liquid (#55 , #57, and #58), six caustic liquid (#46, #48 through #51, and #56); and one sludge (#115). Only drum #52 was empty.

Four 55-gallon steel drums were observed on the catwalk located next to the flotation tanks on the west side of the mill building (#116 through #119). Drum #116 contained brown- and black-colored sludge and drum #117 contained a mixture of brown liquid and sludge. Drums #118 and #119 contained frozen liquid (possibly ice). Also observed were two 55-gallon drums situated on an inaccessible small grated surface located near the roof; they were left in-place without marking with an identification number. ERRS observed a spigot on the bottom of both drums and that each was open on the top (possibly used to collect rain water).

Two 5-gallon pails were observed in and outside the mill building, one pail contained frozen liquid and sludge (#120) and the other (#122) contained a brown gelatinous substance, most likely grease.

Areas Southeast of Mill Building and Former Dry Room

A total of 76 empty 55-gallon steel drums and one empty 500-gallon tank were observed on their sides and stacked on top of one another at the base of the hill southeast of the mill building. Empty drums and containers were noted along the base of the hill further south of the empty drum stockpile. Four 55-gallon drums (#1 through #4) also were observed near the empty drum stockpile. Drums #1, #2, and #3 appeared to contain waste oil, and drum #4 contained water. Oil staining was noted on the ground surface in the vicinity of the tank and surrounding drums #1 through #4.

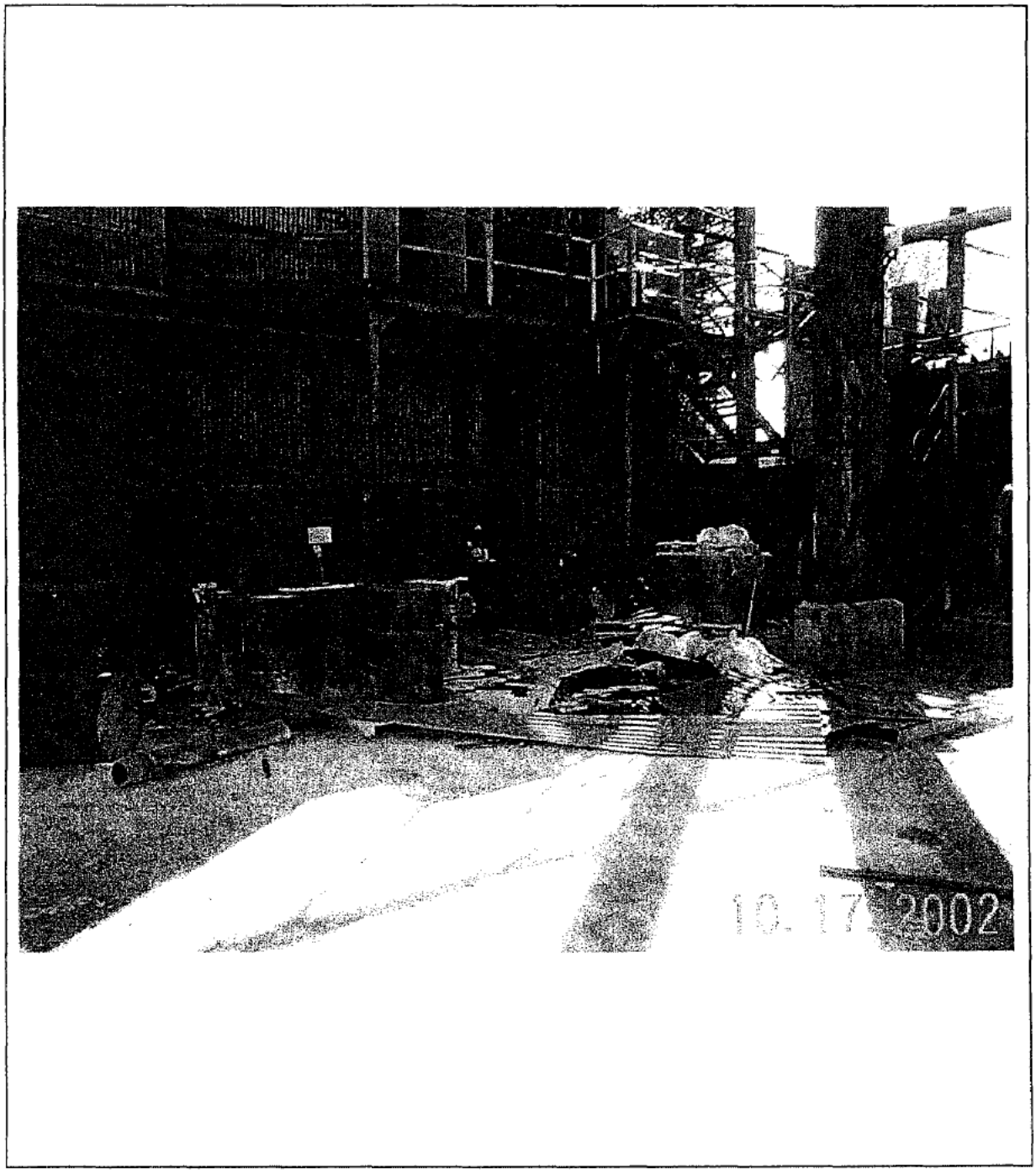

Figure 6. View of the main drum staging area located inside the northeast corner of the mill building, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

Note: Photo was taken by the START during the preparation stage of the removal action on October 17, 2002.

A 3-gallon metal pail contained a hardened black tar-like substance (#123) and two 1-gallon metal oblong cans contained liquid (#124 and #125) were observed near the base of the mountain hill slope south of the former dry room concrete pad.

Five 1-gallon metal oblong cans were observed among eight disposed car and truck batteries located next to the former dry room concrete pad. Three of the five cans were empty, labeled "XYLON," a flammable liquid, printed on one can. The two remaining cans contained liquid, one was labeled "Liquid Wrench," a flammable liquid.

Debris Pile

The road southeast of the mill building leading east to the evaporation/settlement ponds was blocked by a debris pile of drums, containers, wood pallet debris, a small pallet of white crystalline material, unused paper bags marked "Cebar Barite", and other incidental debris.

Four 5-gallon metal pails (#5, #6, #8, and #9), one 30-gallon steel drum (#7), and two 55-gallon steel drums (#10 and #11) were observed alongside the road south of the mill building and in the vicinity of the debris pile. Containers #5 through #9 contained sludge material, possibly associated with gear lubricant or machine grease. Drums #10 and #11 contained light gray waste rock powder.

Former Wooden Shed Platform and Maintenance Repair Shop Pad

Four 55-gallon steel drums and eight 1- or 5-gallon metal containers (#12 through #23) were located on and surrounding the former wooden shed platform (Figure 7). Eleven of the 12 drums and containers in this area contained sludge, possibly gear lubricant, grease, or dried red-colored paint. Drum #21 was a black steel bung-type drum, with a stenciled label printed on its side "Aero Promoter." Also observed were eight disposed car and truck batteries on the wooden shed platform.

Ten 55-gallon steel drums set on wooden pallets were observed staged together on the former maintenance repair shop concrete pad (#28 through #37). Drum #28 was a black plastic-lined steel drum with no label and contained an acidic liquid. The nine remaining drums appeared similar in type and contained liquid.

Ponds, Drum Storage Rack, and Hopper Area

Six 55-gallon empty steel drums were observed on their sides next to the wetland complex, east of the site. A damaged 55-gallon drum (#121) found adjacent to the debris pile shown in Figure 4 was removed from the North Fork Deep Creek. No other drums or containers were observed in the wetland complex or the evaporation/settlement ponds.

Two 55-gallon steel drums (#24 and #25) were observed on their sides at the drum storage rack located north of the mill building. Both drums had Chevron labels.

A 5-gallon metal pail (#26) was observed on its side with light gray granular material (rock powder) spilling out in the lower hopper/primary crusher area. A black 55-gallon drum labeled "silicate of soda" was observed on its side inside the hopper (#27).

Table 2 summarizes the quantity of drums and containers identified and assigned identification numbers, as well as the diesel UST, the 500-gallon tank, and disposed car and truck batteries.

Table 2. Summary of drums and containers observed at the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

Type of Containers	Total Number of Containers	Total Number Assigned Identification Numbers
55-gallon drums with unknown contents	125	125
Empty 55-gallon drums	83	1
Containers with unknown contents [a]	21	21
Empty containers [a]	3	3
10,000-gallon diesel UST	1 or 2 [b]	None
500-gallon tank	1	None
Lead-acid car and truck batteries	18	None

[a] Container sizes ranging from 1-gallon to 30-gallons.
[b] One tank with dual compartments or two tanks situated side-by-side.

Decision Area 2: Underground Storage Tank

The underground storage tank, located approximately 250 feet north of the mill building and 100 feet east of the wooden shed platform next to the wetland complex, is situated west and upgradient of the adjacent North Fork Deep Creek and evaporation/settlement ponds (Figure 5). The structural integrity of the underground storage tank was not assessed.

Two ports and two vent pipes were noted on top of the tank, indicating either dual compartments or two tanks situated side-by-side. A concrete pedestal located immediately south of the tank probably supported a pump dispenser. The bunkered tank measures approximately 12 feet in diameter and 30 feet in length for an estimated capacity of 10,000 gallons. When the contents were investigated with a bailer prior to removal, a distinct petroleum odor (suspected as diesel) was noticed, a product sheen was evident on the surface of the water-product sample, and small droplets of oil-in-water were evident throughout the bailer column. Approximately 4,500 gallons of a water and diesel mixture were removed from the bunkered tank. Approximately 4 feet of fluid was measured inside the tank the day after it was pumped empty, likely indicating recharge by ground water.

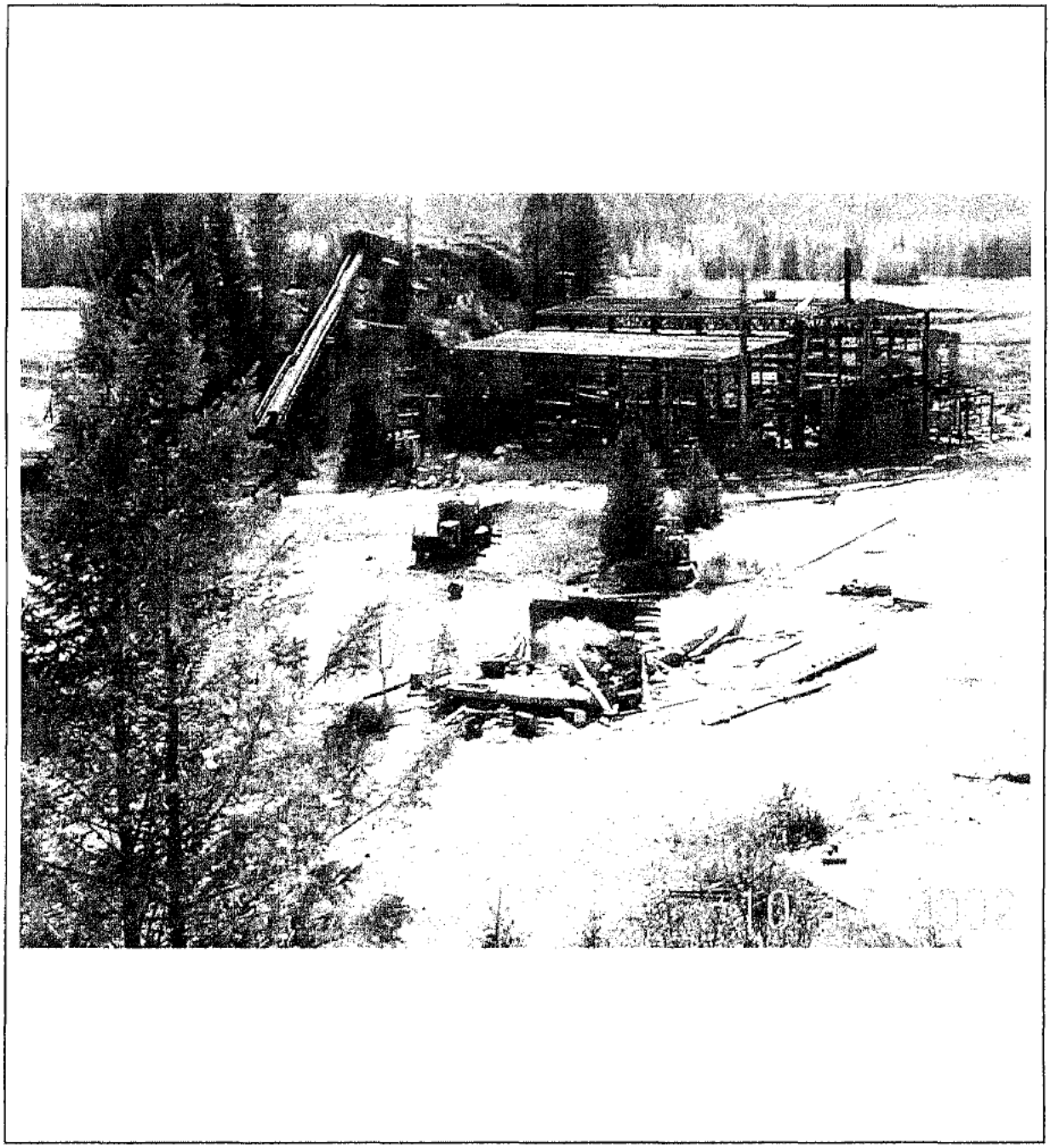

Figure 7. Panoramic view of the mill site, including the wooden shed platform (center foreground), the mill building (upper right background), and the hill top with the portal/shaft on top just east (left) of the mill building, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

Note: Photo was taken by the START on top of the hill near the upper hopper area, looking to the southeast. The photo was taken in preparation of the removal action on October 17, 2002.

Decision Area 3: Transformers and Other Electrical Equipment

All electrical equipment identified on-site was numbered; their locations illustrated in Figure 8.

Descriptions of types of electrical equipment, total estimated oil capacity, manufacturer labels, and other pertinent information are provided on inventory sheets in Appendix B. The oil storage capacity of each transformer and piece of electrical equipment either was noted on attached metal plates identifying the manufacturer and other pertinent information (i.e., kilovolt amps [KVA] power output rating) or was estimated based on similar size equipment observed across the site. Transformers and other oil-filled equipment identified across the site were marked and inventoried in accordance with the Anderson-Calhoun Mine/Mill Removal Action Sampling and Quality Assurance Plan (Herrera 2002).

Three pad-mounted transformers (T1, T2, and T3) and one transformer mounted on top of a power pole (T28) were located southwest of the mill building adjacent to the former electrical room concrete pad. Each pad-mounted transformer had a total oil capacity of 36 gallons, with a blue PCB label affixed to its side certifying a PCB content of less than 50 ppm. Pole-mounted transformer T28 had a total oil capacity of 10 gallons.

Six pad-mounted transformers (T4 through T9) and one transformer mounted on top of a power pole (T27) were located within a fenced enclosure east and adjacent to the former dry room concrete pad. Three pad-mounted transformers each had a total oil capacity of 7.5 gallons (T4, T5, and T6), the other three had a total oil capacity of 20 gallons each (T7, T8, and T9), and the pole-mounted transformer had a total oil capacity of 11 gallons (T27).

One pole-mounted transformer with a 75 KVA power output rating and an estimated oil storage capacity of 40 gallons (T26) was observed west-northwest and uphill from the former dry room concrete pad. The position of crossbars on top of the power pole parallel to the hill slope and the cleared area of trees further uphill behind this transformer towards the engineer's office indicated that T26 supplied electricity to the engineer's office from the substation.

The main power substation was observed within a fenced enclosure west-northwest of the mill building, consisting of a large pad-mounted transformer (T10) and two wire coils (T11 and T12). The transformer had three compartments, with an estimated 1,200 gallons of oil. No oil or fluids was found in either wire coil.

Three large pad-mounted transformers were located within a fenced enclosure north-northeast of the mill building. Each transformer was situated on its own concrete pedestal, rated for 200 KVA power output, and had a total oil capacity of 170 gallons (T13, T14, and T15). One small transformer was also within the enclosure, with a total oil capacity of 9 gallons (T16).

A power pole on the ground with a pole-mounted transformer attached was observed alongside the main road adjacent to the former equipment warehouse concrete pad (T17). The lid was open

and no oil was observed inside the transformer or on the ground beneath it. The estimated oil storage capacity was approximately 10 gallons of oil.

A large empty pad-mounted transformer carcass without a lid was observed on the former maintenance repair shop concrete pad (T18).

Three large platform-mounted transformers on power poles were observed on top of the hill next to the upper hopper area north of the mill building (T19, T20, and T21). Each transformer had a total oil capacity of 44 gallons (Figure 9).

A large pad-mounted transformer within a fenced enclosure was observed north of the upper hopper area and west uphill from the silo (T22). A yellow PCB-contaminated oil label was affixed to the side, certifying a PCB concentration greater than 50 ppm. Transformer T22 had a total oil capacity of 114 gallons.

One pole-mounted transformer with the lid attached was observed on the hill slope south of the hopper (T23). The OSC observed oil-stained ground beneath the transformer. Transformer T23 had a total oil capacity of 9 gallons.

An empty pole-mounted transformer was observed on the ground west of the upper hopper area alongside the main gravel road (T24). No oil stained ground beneath the transformer was observed. Transformer T24 had an estimated oil storage capacity of 10 gallons.

A pole-mounted transformer attached to a power pole was observed on the ground south of the former office and assay lab concrete pad (T25). The lid was intact; the transformer had a total oil capacity of 34 gallons.

Electrical equipment containing dielectric oil was observed in the lower hopper/primary crusher area (Figure 10), including three oil-filled circuit breakers (T29, T30, and T35; each with an estimated oil storage capacity of 2 gallons), a linestarter (T31; estimated oil storage capacity of 20 gallons), a controller switch (T32; estimated oil storage capacity of 30 gallons), an under-voltage trip switch (T33; estimated oil storage capacity of 2 gallons), and a wall-mounted transformer (T34; estimated oil storage capacity of 5 gallons). Oil staining on the wall and concrete ledge beneath transformer T34 was observed. Another trip switch was observed in this area (T36; estimated oil storage capacity of 2 gallons), but it was empty.

An empty transformer (T37), a capacitor (T38), and an empty trip switch (T41) were observed west-southwest of the upper hopper area. Capacitor T38 was the only equipment in this area containing oil (approximately 3 gallons). Capacitor (T47) was found in this area during a second sweep of the site, after removal activities were completed. Capacitor T47 was similar to T38, rusted, but did not appear to contain any oil.

Two large platform-mounted transformers (T39 and T40) were observed west and uphill from the former maintenance repair shop concrete pad. Both transformers were hidden behind trees,

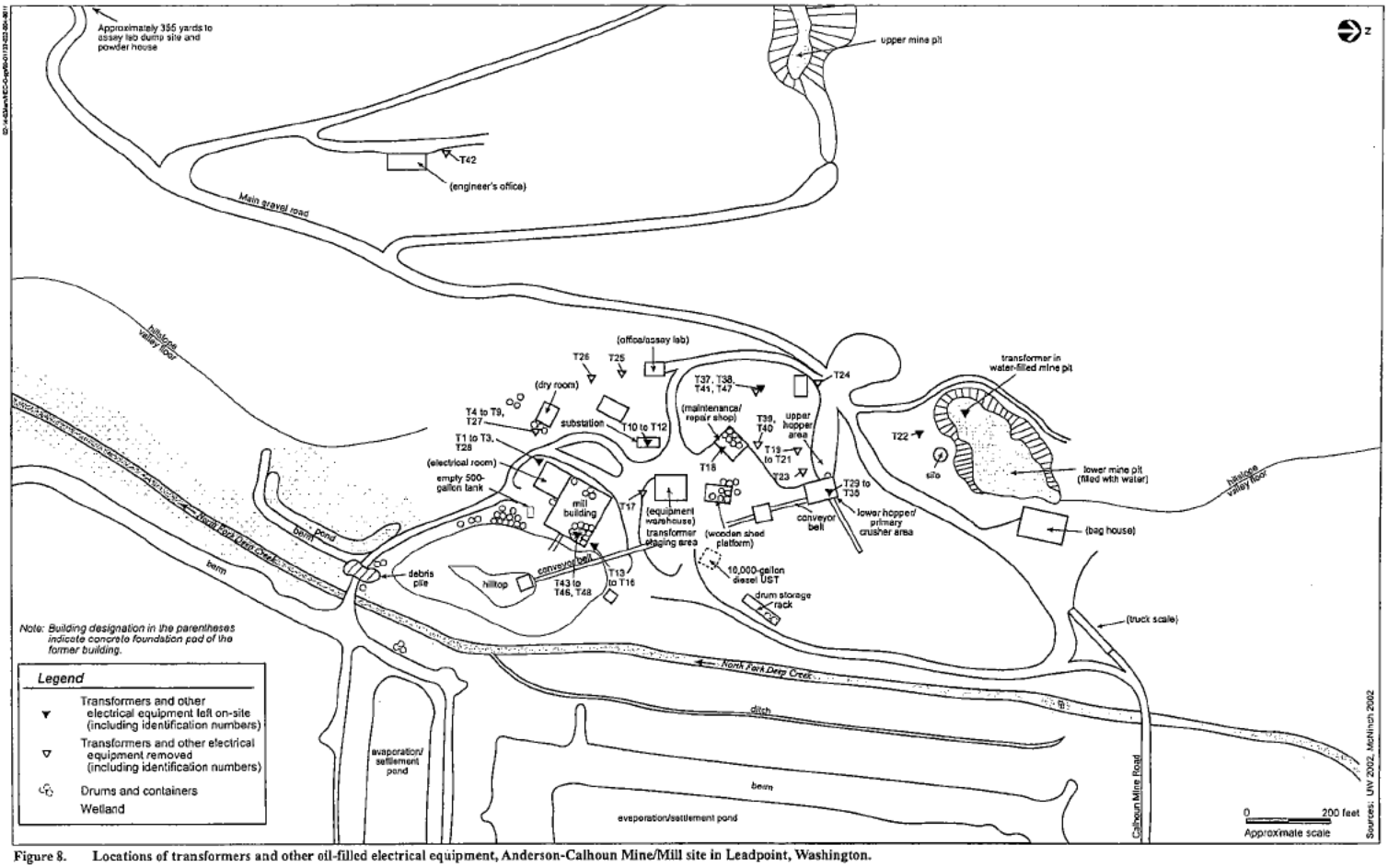

Figure 8. Locations of transformers and other oil-filled electrical equipment, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

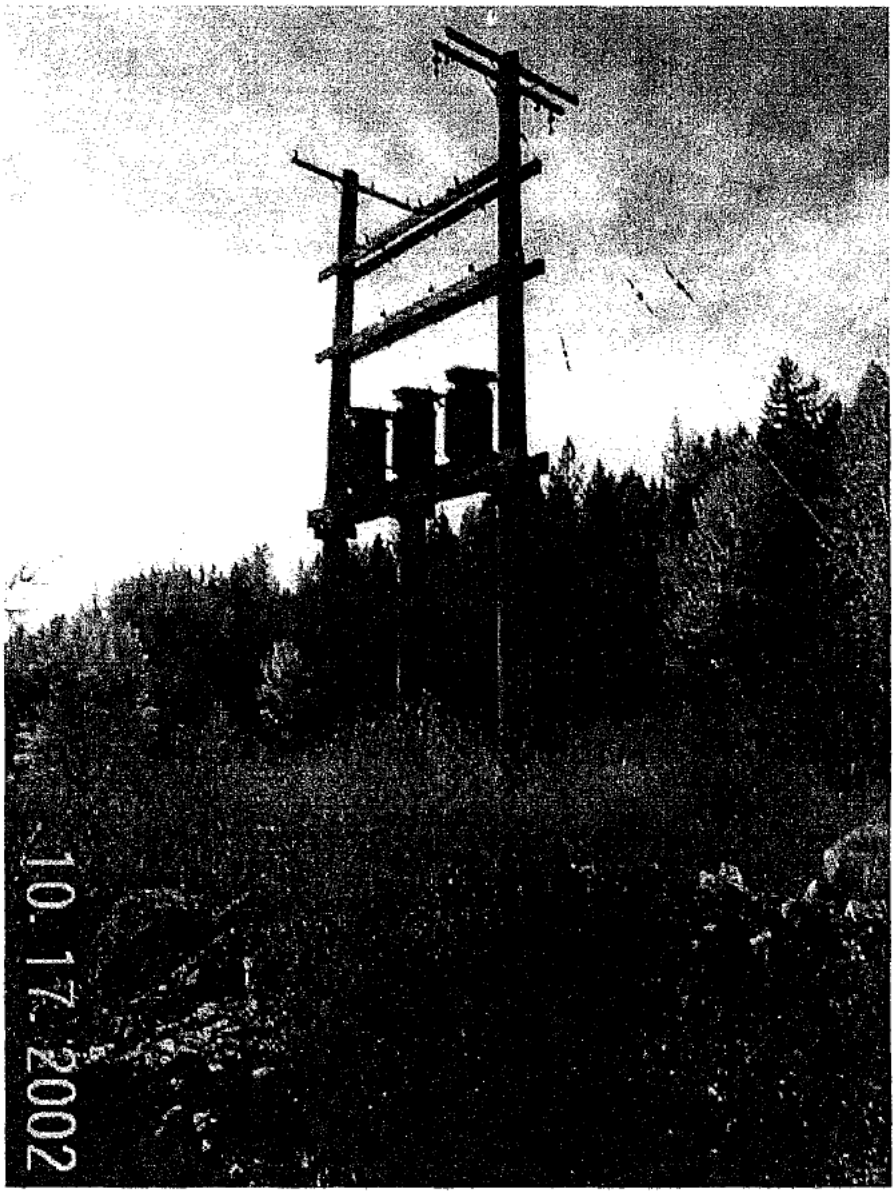

Figure 9. View of three transformers on a pole-mounted platform (later designated as T19, T20, and T21), view from the upper hopper area looking to the southwest, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

Note: Photo was taken by the START during the preparation stage of the removal action on October 17, 2002.

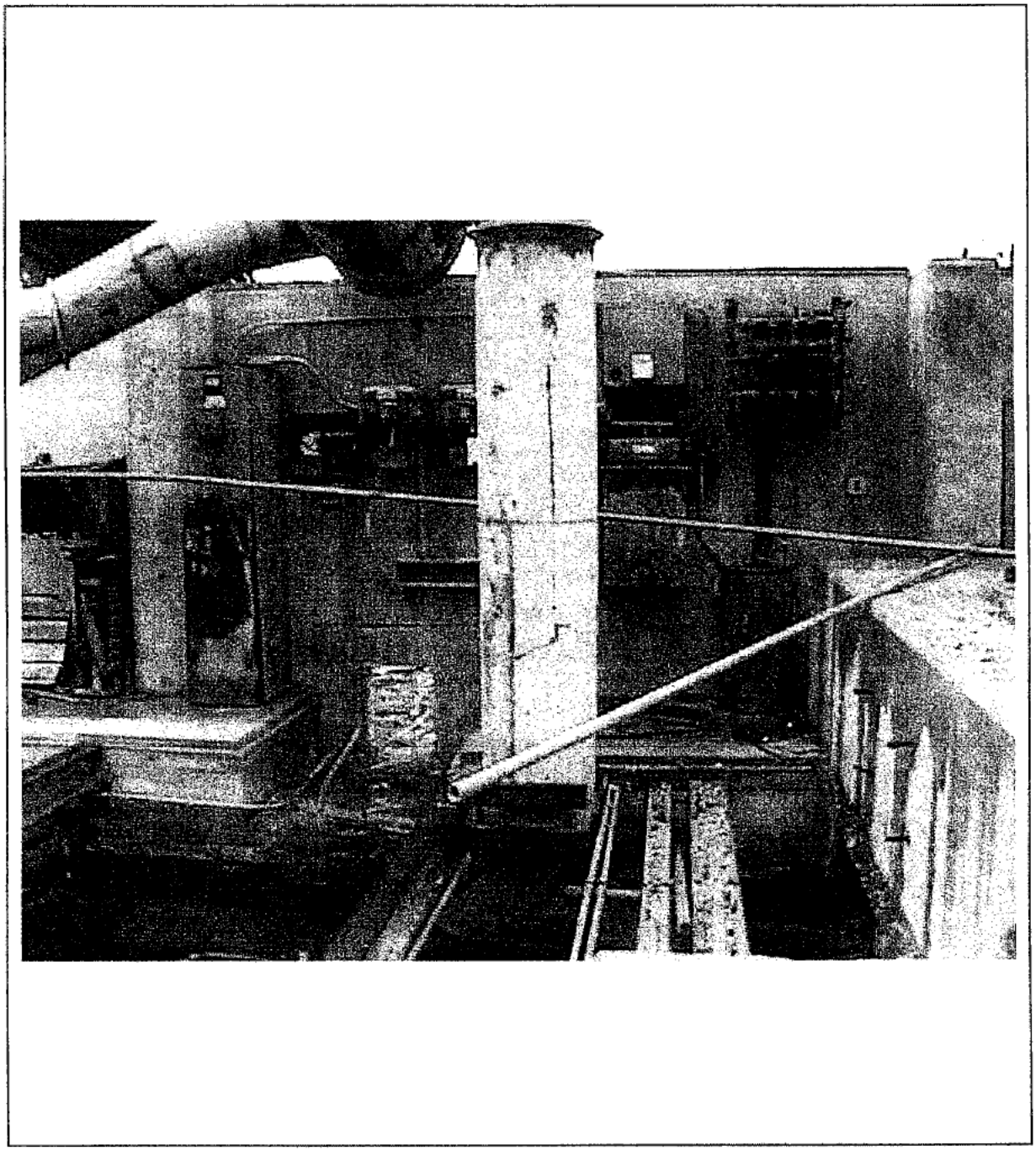

Figure 10. Oil-filled electrical equipment including switches and circuit breakers located in the lower hopper/primary crusher area, Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

Note: Digital still photograph was taken from videotape by START on October 29, 2002, prior to the removal action.

visible from above, standing near T37 and T38. Transformer T39 had a total oil capacity of 60 gallons and transformer T40 had an estimated oil storage capacity of 30 gallons.

A pole-mounted transformer (T42) that supplied power to the former engineer's office building was located southwest and uphill from transformer T26 and the main mine/mill site. Transformer T42 had a total oil capacity of 20 gallons.

Several oil-filled circuit breakers and switches were observed on the upper catwalk in the mill building above the main drum area and on the first floor next to the drums, including a switch for the main disc (T43; estimated oil storage capacity of 6 gallons), two circuit breakers for the rod mill disc and the rod mill starter (T45 and T46; each has an estimated oil storage capacity of 2 gallons), and a circuit breaker and switch for the regrind starter (T48; estimated oil storage capacity of 2 gallons each). The circuit breaker for the main disc (T44) did not contain any oil. James G. Murphy, Inc. auction ticket labels were affixed to T43 and T44.

Table 3 summarizes the quantity of transformers and other electrical equipment identified and assigned identification numbers, as well the quantity of equipment removed from or left on-site.

Table 3. Summary of transformers and other electrical equipment observed at the Anderson-Calhoun Mine/Mill site in Leadpoint, Washington.

Type of Electrical Equipment	Total Number of Equipment Assigned Identification Numbers	Total Number of Equipment Removed From Site	Total Number of Equipment Left On-site [b]
Transformers containing oil	27	21	6
Empty transformers	4	3	1
Miscellaneous electrical equipment [a] containing oil	12	1	11
Empty miscellaneous electrical equipment [a]	6	3	3

[a] Miscellaneous electrical equipment included circuit breakers, switches, capacitors, and other equipment not identified as a transformer.
[b] Large oil-filled transformers and other electrical equipment were drained of oil prior to leaving on-site.

Decision Area 4: Assay Lab Dump Site

The assay lab dump site was discovered during a site reconnaissance of the upper mine pit area on October 30, 2002. The dump site was located on the east side of the main gravel road approximately 0.5 mile southwest and uphill from the main mine/mill site (Figure 3). The former powder house, where explosives used for mining were kept, was located across the road. The powder house was found empty. A barbed wire fence oriented east/west and across the road approximately 240 yards south of the dump site appeared to represent the mine property boundary.

The dump site included 38 glass and plastic bottles and jars ranging in size from 1-ounce to 2-pints containing unknown liquid and solid materials, plus empty glass jugs and broken amber-colored glass bottles with rubber stoppers and flexible tubing. Most of the containers did not have labels or the labels found appeared to be laboratory identification sample numbers. The only identifiable labeled container was an empty 1-gallon metal oblong can of acetone. Also found among the bottles were unused triplicate paper receipt slips printed with the former Calhoun Mine logo. Other items noted at the dump site were several empty and rusted 55-gallon drums partially covered by tree limbs and soil.

Decision Area 5: White Crystalline Waste Piles

Three white crystalline waste piles were identified (Figure 5). The first pile (estimated 1 cubic yard) included a small pile of white crystalline material on a pallet located near the debris pile, accompanied by unused printed paper sacks labeled "Cebar Barite."

The second waste pile (estimated 5 cubic yards) was located at the base of the hill south of the lower hopper/primary crusher area. This material appeared chalky and softer than the other piles.

The third and largest waste pile consisted of several pallets loaded with white crystalline material (estimated 10 cubic yards), some were contained in deteriorated unmarked paper sacks located at the center of the wooden shed platform. No identifiable labels or other markings were noted.

Daily Activities

The following activities occurred during the Anderson-Calhoun Mine/Mill Removal Action, as documented by START and OSC oversight:

October 27, 2002
Sunday

- START and ERRS mobilized to the Anderson-Calhoun Mine/Mill site.

October 28, 2002
Monday

- START videotaped the site prior to removal action activities, prepared drum/container and transformer/electrical equipment inventories, and labeled each drum or transformer with a unique identification number.
- ERRS conducted a site walk to locate drums and transformers not identified in the preliminary site assessment.
- Prior to this area being videotaped, ERRS segregated 76 empty 55-gallon drums from those containing unknown substances located southeast of the mill building.

- ERRS prepared a bermed visqueen-lined staging area on the former equipment warehouse concrete pad next to the main road (refer to as the transformer staging area).
- ERRS conducted hazard categorization analysis on drums START had labeled and inventoried.
- ERRS used front loader equipment to transfer drums located in outlying areas to the transformer staging area.
- ERRS collected confirmation oil samples for PCB analysis from transformers too large to be removed from the site, including T10 (substation), T13 through T15, and T22.
- An accidental spill occurred late in the day during ERRS' attempt to remove an oil-filled transformer (T21) from its pole-mounted platform, which caused the crane to topple over and drop the transformer onto the slope below. Removal work was halted to upright the crane and assess the condition of T21 (refer to Transformer T21 Spill Incident section of this report).

October 29, 2002 Tuesday

- One START member demobilized from the site to deliver five confirmation oil samples to North Creek Analytical laboratory in Spokane, Washington for a 24-hour turn-around time on PCB analysis.
- START observed and documented ERRS removal of transformer T21 from the slope using a track hoe. ERRS attempted to remove oil-filled transformer T20 from the same pole-mounted platform as T21; however, oil released from T20 onto the slope below as it was swung over to the staging area (upper hopper area). The OSC and START halted work and revised the work plan to remove pole-mounted transformers by draining oil into drums prior to dismounting them from power poles.
- ERRS drained oil from pole-mounted transformers T19, T26, T27, and T28 into drums, and START collected confirmation oil samples.
- START observed and documented ERRS removal of oil-stained soil from the hill slope where oil released from transformers T20 and T21. A track hoe and hand shovel were used.
- ERRS cleared debris and a created work area inside the northeast corner of the mill building around the main drum staging area. Began hazard categorization analysis on drum contents.

- START continued labeling and inventorying remaining drums, transformers, and other oil-filled electrical equipment across the site.
- During site walk, START discovered two additional transformers (T39 and T40) located on the hill slope above the former maintenance repair shop concrete pad that were not previously identified.
- START conducted XRF testing for lead and other metals in soil near the wooden shed platform to confirm levels detected in an earlier preliminary site assessment.
- Change of EQM on-site project manager as per OSC request.

October 30, 2002 Wednesday

- START continued observing and documenting ERRS draining oil and removing pole-mounted transformers from the hill slope. Transformer carcasses were staged within the bermed visqueen-lined transformer staging area. ERRS disassembled and drained oil from various circuit breakers, switch boxes, and other electrical equipment located in the lower hopper/primary crusher area.
- START conducted air monitoring (cyanide and four gas meters) in the main drum staging area, where ERRS continued hazard categorization analysis on drum contents and began consolidating and separating drums based on hazard categorization results. START collected product samples of selected drums representing different waste streams. ERRS began crushing empty drums identified in the area southeast of the mill building.
- ERRS conducted field cyanide testing on one of several waste rock powder stockpiles located south and southwest of the mill building.
- START conducted a site walk uphill from the main mine/mill site, along the main gravel road and upper mine pit area. START discovered a pole-mounted transformer (T42) near the former engineer's office, and a suspected assay lab dump site alongside the main gravel road approximately ½ mile southwest of the main mine/mill site.
- START labeled and inventoried circuit breakers and switch boxes located inside and upper level at the northeast corner of the mill building.
- START began conducting GPS survey of the site.

October 31, 2002 Thursday

- Two over-the-road dump trucks (18 cubic yard capacity each) with pup trailers (15 cubic yard capacity each) arrived

at the site. The dump boxes were lined with visqueen prior to ERRS loading crushed drums and Class 9 waste material. Both dump trucks were filled and transported the waste offsite for land disposal at the Columbia Ridge Landfill in Arlington, Oregon.

- Two 5,000-gallon tanker trucks arrived at the site and ERRS began vacuuming flammable liquids and waste oil identified in drums, mineral oil containing less than 50 ppm PCBs from transformers, and diesel from the UST. ERRS and OSC discovered the UST may consist of either a dual compartment tank or two smaller sized tanks situated side by side. START collected two product samples from the UST prior to being vacuumed. Both tanker trucks left the site with flammable liquids and oil and transported to Burlington Environmental, Inc. facility in Tacoma, Washington for incineration.
- START continued observing and documenting ERRS removal of oil-stained soil and rock from transformer oil spills and T21 on the hill slope. ERRS loaded oil-stained soil and rock into a 20 cubic yard visqueen-lined roll-off box. The roll-off box transported the waste to Burlington Environmental, Inc. in Kent, Washington for land disposal. START collected one confirmation soil sample from excavated area where oil from the T21 spill location after the soil was excavated.
- START, OSC, and ERRS assessed the assay lab dump site to determine appropriate removal action requirements.
- ERRS drained and removed pole-mounted transformer T42 located near the engineer's office.
- START located and marked disposed car and truck batteries observed across the site, with the majority located near the wooden shed platform and two areas near the former dry room pad.

November 1, 2002
Friday

- Two semi-truck trailers with 85 overpack drums arrived at the site. ERRS began overpacking drums located in the main drum staging area. ERRS loaded the semi-truck trailers with overpacked drums and DOT secondary containment boxes filled with transformer carcasses.
- One START member demobilized from the site to deliver five product samples collected from drums to North Creek Analytical laboratory for pH analysis (24-hour holding time). The START member also gathered information and maps from Stevens County Assessors office and Valley

Title Company in Colville, Washington showing the mine property boundary and names of adjacent private property owners.

- START monitored oil from transformer T22 being drained into three 55-gallon drums. Oil from T22 was found to contain 140 ppm PCBs and therefore, oil was drummed and transported offsite separately from other transformers to Burlington Environmental, Inc. in Kent, Washington for incineration. START discovered a power pole with possible pole-mounted transformer(s) underwater in the water-filled lower mine pit while monitoring T22.
- ERRS loaded 18 disposed car and truck lead-acid batteries into a semi-truck trailer on a plastic-lined and wrapped pallet. The batteries were transported offsite to Burlington Environmental, Inc. in Kent, Washington for neutralization and recycling.
- ERRS completed draining and removing transformers and staging the carcasses for loading into DOT secondary containment boxes and into two semi-truck trailers. ERRS drained oil from several circuit breakers and switch boxes located on upper catwalks above main drum staging area. The oil was transported to Burlington Environment, Inc. in Tacoma, Washington for incineration. The carcasses were transported to Burlington Environmental, Inc. in Kent, Washington for scrap metal recycling.

November 2, 2002
Saturday

- A third semi-truck trailer arrived at the site for the overpack drums collected at the main drum staging area. Chemical spills and other debris surrounding drums in the main drum staging area (including white waste material, hardened silicate of soda, sodium hydroxide powder, etc.) was collected and placed into three overpack drums (each 85 gallons capacity) for transport offsite for land disposal at the Columbia Ridge Landfill in Arlington, Oregon.
- ERRS collected 38 bottles and jars at the assay lab dump site, transported them to the transformer staging area, and conducted hazard categorization analysis on their contents while START documented the results. The contents were consolidated into a 5-gallon bucket of Solidisorb material and transported with other flammable materials to Burlington Environmental, Inc. in Tacoma, Washington for incineration.
- (b) (6) (b) (6) visited the site and was interviewed by the START project manager

regarding information on mill processing plant operations, boundaries of the mine/mill property, and the identification of demolished buildings across the site. (b) (6) also expressed concern regarding recent on-site cattle deaths as a result of possible ingestion of material from the white crystalline waste piles.

- START informed the OSC of the interview results. Per OSC request, START collected samples from three white crystalline waste piles for chemical analysis, including a small pile near the debris pile, a large pile on the wooden shed platform, and a pile at the base of the hill slope near the hopper area.
- ERRS filled the large transformer carcasses staged at the site with clay absorbent material, including T10, T13, T14, T15, and T22.
- ERRS used a front loader to transfer soil and rock from a source in the upper hopper area to cover the T21 release excavation.
- START completed GPS survey of the site, including the locations of the assay lab dump site, barbed wire fence, engineer's office, and a line survey of the main gravel road.
- OSC and ERRS demobilized from the site.
- START videotaped the site to document conditions after the removal action activities were completed.
- START demobilized from the site in the afternoon and transported the remaining product samples collected from drums to the North Creek Analytical laboratory in Bothell, Washington.

Interview—(b) (6)

The following information was provided by (b) (6)
(b) (6)
(b) (6)

(b) (6) identified the locations of former operational buildings associated with the mine and mill processing plant (Figure 4). He described the general mill operation, as follows:

- Ore rock was stockpiled east of the hopper/crusher buildings after transfer by conveyor belt from the mine. It was loaded into dump trucks, hauled to the upper hopper area, and fed through the hopper to the primary crusher or loaded onto a conveyor belt to the primary crusher. Another conveyor

belt transferred the crushed rock to the secondary crusher building for further reduction to approximately 3/8-inch size rock.

- The 3/8-inch rock was transferred by conveyor belt to the top of the hill into the shaft and portal that serves as another hopper, then transferred by conveyor belt into the mill building where it was further crushed (crushers and ball mills) to produce a fine rock powder. The crushers and ball mills were located in the eastern and northern sections of the mill.

- The rock powder was placed into large flotation tanks and mixed with chemicals and other materials to separate ore from host rock. (b) (6) was unaware of which chemicals were used or the process employed. The end product was a slurry material that floated to the surface, and then was skimmed and filtered through a series of filtering discs. The flotation tanks and filtering discs were located in the upper sections of the mill accessed by catwalks in the western half.

- Material on the filtering discs was dried into powder form. Two large concrete cradles located south of the mill building previously held a large propane tank possibly used for the drying process. The dried powder was blown through a series of large pipes to the silo for storage, followed by the bag house to be bagged prior to shipping.

(b) (6) also provided the following historical information:

- When the mine/mill operation closed in 1969, Calhoun Mine Road was closed by Stevens County. Residences with legal right of access for the road were private property owners on 40-acre parcels to the north and northwest of the mine/mill property. Private property owners on 10- to 20-acre parcels to the southwest and south had legal right of access on the main gravel road leading south and to Leadpoint. However, these residents occasionally drove through the mine/mill site on the main gravel road and Calhoun Mine Road. A padlock was placed on the gate along Calhoun Mine Road to prevent use of this road. (b) (6) presumed the barbed wire fence that crosses the main gravel road, approximately ½-mile southwest of the main site is the mine property boundary.

- (b) (6) was aware of the assay lab dump site near the former powder house that stored explosives, and believes, with some uncertainty, that the lab bottles and other debris may have been dumped by James G. Murphy, Inc. Auctioneers approximately four years ago.

- (b) (6) expressed satisfaction that the mine/mill site was being cleaned up and expressed concern regarding kids accessing or playing around the site, possibly getting hurt, particularly where the drums of unknown substances were stored in the mill building. He suspected that the kids shot bullets into some of the drums. He also expressed concern about whether pallets and piles of white crystalline material observed on-

site was barium carbonate or barium sulfate and if it was being removed during the work. He stated that barium carbonate was toxic to cattle and was possibly related to recent on-site cattle deaths.

Sample Collection and Analytical Results

START and ERRS personnel collected representative product samples from drums and containers based on field hazard categorization results and oil samples from transformers for confirmation laboratory analysis. All samples collected by START and ERRS were stored on ice, and kept under chain-of-custody control by START until hand delivered to the laboratories for analysis; North Creek Analytical, Inc. in Spokane (all but semi-volatile organic compound [SVOC] analysis) and Bothell, Washington (SVOC analysis only). Samples were collected and analyzed in accordance with the Anderson-Calhoun Mine/Mill Removal Action Sampling and Quality Assurance Plan (Herrera 2002).

Due to below-freezing temperatures during the entire duration of removal action activities, the majority of drum contents had solidified, and therefore, samples were collected by chipping out solidified material using dedicated stainless steel spoons and placing the chunks into sample containers. Other materials that were in liquid form were collected using dedicated drum thieves. Field hazard categorization data collection sheets for drum and container materials are provided in Appendix D. Table 4 summarizes the laboratory analyses performed.

Table 4. Laboratory analysis summary for product and oil samples collected at the Anderson-Calhoun Mine/Mill site.

Waste Material	Analysis	Matrix	Method Number
Drums and containers	Volatile organic compounds	Product	EPA 8260B
	Flash point	Product	EPA 1010/1020
	pH	Product	EPA 9040B/9045C
	Priority pollutant metals [a]	Product	EPA 6010/7471
	Semi-volatile organic compounds	Product	EPA 8270C
	British thermal units (BTU)	Product	ASTM D240-02
Transformers and other electrical equipment, and soil sample SPILL	Polychlorinated biphenyls	Oil, soil	EPA 8082
Diesel UST and soil sample SPILL	Total petroleum hydrocarbons—diesel and heavy oil	Product, soil	NWTPH-Dx
White crystalline waste piles	Sulfate	Product	EPA 300
	Carbonate/bicarbonate	Product	EPA 310.1
	Priority pollutant metals plus calcium, iron, magnesium, potassium, and sodium	Product	EPA 6010/7471

[a] Priority pollutant metals included antimony, arsenic, barium, beryllium, cadmium, chromium, copper, nickel, selenium, silver, thallium, zinc, lead, and mercury.

Decision Area 1—Drums and Containers

Drum contents were collected and analyzed by ERRS representatives for field hazard categorization analysis to determine disposal waste streams. A total of 150 drums and containers of unknown material were inventoried by START. Of these, 52 were analyzed using field hazard categorization by ERRS. Based on hazard categorization results, 12 samples that represented individual waste streams were collected and delivered to North Creek Analytical Laboratories in Spokane and Bothell, Washington for confirmation laboratory analysis (Table 4). The 12 samples included:

Five product samples collected from drums #28, #51, #56, #73, and #135 for confirmation laboratory analysis of pH levels.

Seven product samples collected from drums #3, #29, #53, #98, #103, #108, and #124 for confirmation laboratory analyses based on field hazard categorization results.

Table 5 summarizes field hazard categorization results and detected constituents from laboratory analysis. Data validation and laboratory reports with a complete list of results for product samples are provided in Appendix E.

Decision Area 2—Underground Storage Tank

Because of the presence of two fill ports and the potential that the 10,000-gallon UST either contained dual compartments or that two smaller-sized tanks existed, two product samples, one from each fill port (Tank 1 and Tank 2) were collected for chemical analysis. Samples were collected using a dedicated disposable bailer attached with new nylon twine. Both samples were delivered to North Creek Analytical Laboratories, Inc. in Spokane, Washington and analyzed for total petroleum hydrocarbons in the diesel- and lube oil-range using Ecology northwest total petroleum hydrocarbons (TPH) test method NWTPH-Dx. No diesel- or lube oil-range hydrocarbons were detected above laboratory reporting limits in either sample (Table 6). The laboratory reporting limits were greater than MTCA method A cleanup levels for diesel- and lube oil-range hydrocarbons because of the limited sample volume of each sample submitted to the laboratory for analysis.

Table 5. Field hazard categorization and analytical results for the drums and containers at the Anderson-Calhoun Mine/Mill site.

Container ID (Sample ID)	Hazard Categorization Results	Laboratory Analytical Results - detected constituents			Material Designation
Drum-3 (PS-3)	Flammable liquid (oil-like)	Flash	>100	°C	Flammable material
		SVOCs	ND		
		BTU	19,000	BTU/lb.	
Drum-28 (28)	Acid (dark green-colored liquid)	pH	2.60	pH units	Acidic liquid
Drum-29 (PS-29)	Caustic liquid	pH	10.0	pH units	Corrosive material
Drum-51 (51)	Caustic liquid	pH	10.4	pH units	Corrosive material
Drum-53 (PS-53)	Flammable liquid (oil-like)	Flash	>100	°C	Flammable material
		n-Butylbenzene	0.277	mg/kg	
		Trichloroethene	0.0800	mg/kg	
Drum-56 (56)	Caustic liquid	pH	11.4	pH units	Corrosive material
Drum-73 (73)	Base liquid (silicate of soda)	pH	11.6	pH units	Corrosive material
Drum-98 (PS-98)	Flammable liquid	Flash	>100	°C	Flammable material
		n-Butylbenzene	0.271	mg/kg	
		n-Propylbenzene	0.355	mg/kg	
		Tetrachloroethene	0.0982	mg/kg	
		Trichloroethene	0.0708	mg/kg	
		1,2,4-Trimethylbenzene	0.685	mg/kg	
Drum-103 (PS-103)	Flammable liquid	Flash	>100	°C	Flammable material
		Acetone	3.32	mg/kg	
		Tetracloroethene	0.221	mg/kg	
		Trichloroethene	0.0716	mg/kg	
Drum-108 (PS-108)	Flammable liquid	Flash	58.0	°C	Flammable material
		VOCs	ND		
Drum-124 (PS-124)	Flammable liquid		46.0	°C	Flammable material
			980	mg/kg	
			32,000	mg/kg	
			13,800	mg/kg	
			64,000	mg/kg	
			271,000	mg/kg	
			109,000	mg/kg	
			7,720	mg/kg	
Drum-135 (135)	White translucent base liquid	pH	11.1	pH units	Corrosive material

ND No constituents detected above the laboratory practical quantitation limits (PQLs).

Table 6. TPH analytical results of product samples (mg/kg) collected from the 10,000-gallon underground storage tank, Anderson-Calhoun Mine/Mill site, Leadpoint, Washington.

Sample Identification	Diesel-range Hydrocarbons	Lube Oil-range Hydrocarbons
Tank 1	ND (1,200)	ND (3,000)
Tank 2	ND (1,200)	ND (3,000)

Values reported in milligrams per kilograms.
ND (1,200) Constituent not detected above the laboratory reporting limit shown in parentheses.

Decision Area 3—Transformers and Other Electrical Equipment

A total of 39 transformers and other electrical equipment (i.e. circuit breakers, switches, capacitors, etc.) containing dielectric oil were identified and inventoried by START. Oil samples were collected either from individual transformers, a composite of several transformers from the same manufacturer, or a composite collected from several electrical equipment located in the same area (i.e. lower hopper/primary crusher area). Oil samples from transformers were collected by opening a valve spigot located near the base of each transformer and directly filling the sample container. Oil from transformers of the same manufacturer or from various circuit breakers, switch boxes, and other equipment located in the lower hopper/primary crusher area were drained and consolidated into 55-gallon drums. A sample from the drums representing transformer or equipment groups was collected using dedicated drum thieves.

A total of 27 samples were collected including:

Five samples from transformers too large to be removed from the site or with a PCB-contaminated label affixed on the side, including T10 (substation; middle compartment) and T13, T14, T15, and T22 (PCB-contaminated label). These samples were hand delivered to the laboratory for 24-hour turn-around PCB analysis to determine appropriate disposal requirements based on the results (delivered on October 29, 2002; refer to Daily Activities section).

Twenty-two samples from transformers and other oil-filled electrical equipment including samples from the north and south compartments of T10 substation transformer and a composite sample from seven electrical equipment (T29 through T35) located in the lower hopper/primary crusher area.

Table 7 summarizes the analytical results of oil drained from the equipment for disposal. Data validation and laboratory reports with a complete list of results for oil samples are provided in Appendix E.

Table 7. PCB results of oil (mg/kg) collected from transformers and other electrical equipment at the Anderson-Calhoun Mine/Mill site.

Sample ID(s)	Equipment ID and Type	Polychlorinated Biphenyls [a] (mg/kg)
T1, T3	Composite of transformers T1 and T3	5.12
T2	Transformer T2	2.32
T4, T5, T6	Composite of transformers T4, T5, and T6	ND (1.0)
T7, T8, T9	Composite of transformers T7, T8, and T9	1.63
T10	Middle compartment of transformer T10	ND (1.0)
T10 South	South compartment of transformer T10	ND (1.0)
T10 North	North compartment of transformer T10	ND (1.0)
T13	Transformer T13	1.36
T14	Transformer T14	7.37
T15	Transformer T15	4.29
T16	Transformer T16	ND (1.0)
T19	Transformer T19	ND (1.0)
T19, T20	Composite of transformers T19 and T20	ND (1.0)
T21 [b]	Transformer T21	ND (1.0)
T22	Transformer T22	140
T25	Transformer T25	25.9
T26, T27, T28	Composite of transformers T26, T27, and T28	2.03
T29 to T35 (Crusher-Comp)	Composite of electrical equipment in lower hopper/ primary crusher area	ND (1.0)
T39	Transformer T39	ND (1.0)
T40	Transformer T40	ND (1.0)
T42	Transformer T42	ND (1.0)
T48	Oil circuit breaker and switch T48	ND (1.0)

Values reported in milligrams per kilogram (mg/kg).
ND (1.0) Constituent not detected above the laboratory reporting limit shown in parentheses.
[a] Only Aroclor 1260 PCB was identified in PCB-containing oil samples.
[b] Oil sample from T21 was collected prior to the accidental spill.

Decision Area 4—Assay Lab Dump Site

It was determined by the OSC and ERRS that the potential for picric acid and other explosive chemicals typical of mine site waste among the assay lab dump site was low, considering that the bottles appeared to have been dumped rather than placed at this location. All bottles and jars that contained unknown liquids and solids were collected, transported to the transformer staging area, and ERRS conducted field hazard categorization analysis of the contents. Descriptions of the liquids and solids contained in the bottles, the estimated volume of material, and the hazard categorization results are provided on data summary sheets in Appendix D.

No product samples were collected for confirmation laboratory analysis from the assay lab dump site, due to the small amount of unknown liquids and solids and field hazard categorization results. Table 8 summarizes the hazard categorization results of 38 bottles and jars collected from the dump site and estimated volume of each hazard category waste material identified.

Table 8. Summary of bottles and jars collected at the assay lab dump site, Anderson-Calhoun Mine/Mill site, Leadpoint, Washington.

Hazard Category	Total Number of Filled Bottles Found	Estimated Volume (ounces)
Toxic liquid	19	194
Toxic solid (powder)	2	28
Caustic liquid	5	72
Caustic solid (powder)	1	6
Acid liquid	7	35
Flammable liquid	4	14

Decision Area 5—White Crystalline Waste Piles

Three samples of white crystalline waste material were collected from readily accessible piles and analyzed to determine the presence or absence of barium carbonate and other metals (Table 4). Sample B1 was collected from a small pallet of white crystalline material located near the debris pile. Sample B2 was collected from a large waste pile located at the center of the wooden shed platform. Sample B3 was collected from a white chalky material located at the base of the hill slope near the lower hopper area. Samples were collected using dedicated stainless steel spoons by chipping out chunks and directly placed them into sample containers.

Sample B1 and B2 locations appeared to have similar physical characteristics, with white crystalline material cemented together due to exposure to the environment. Sample B3 was a white chalky material and considerably softer.

When exposed to acids, carbonate compounds effervesces while sulfate compounds exhibit no reaction. Prior to chemical analysis, START requested North Creek Analytical laboratory to differentiate carbonate from sulfate compounds by observing the chemical reactions of each sample when a small amount was mixed separately with hydrochloric acid (HCl) and sulfuric acid (H_2SO_4). Acid testing of all three samples was conducted on November 5 and 8, 2002, respectively. All three samples effervesced when mixed with each acid, indicating that carbonate and bicarbonate compounds were present. Table 9 summarizes the laboratory observations, including physical characteristics and observed chemical reactions using HCl and H_2SO_4. Laboratory analytical results of all three samples are summarized below in Table 10.

Table 9. Acid testing observations of samples B1, B2, and B3 collected from white crystalline waste piles at the Anderson-Calhoun Mine/Mill site.

Laboratory Sample Identification	Observed Physical Characteristics	Observed Chemical Reaction to HCl	Observed Chemical Reaction to H_2SO_4
B1	Slightly off-white in color; hard chalk-like solid.	Vigorous release of CO_2; sample totally dissolved.	Slight release of CO_2; reaction stopped quickly; most of the sample dissolved.
B2	True white in color; granular-like solid similar to sugar.	Vigorous release of CO_2; sample totally dissolved.	Vigorous release of CO_2; exhibited immediate dissolution of the sample.
B3	Slightly off-white in color; powdery-like solid similar to talcum powder.	Vigorous release of CO_2; sample totally dissolved, but final digestate was slightly opaque.	Vigorous release of CO_2; only half of the sample dissolved.

Table 10. Metals, sulfate, and carbonate results of samples B1, B2, and B3 collected from white crystalline waste piles at the Anderson-Calhoun Mine/Mill site.

Sample Identification	Laboratory Analytical Results (detected constituents only)		
B1	Barium	39.6	mg/kg
	Chromium	0.500	mg/kg
	Nickel	1.31	mg/kg
	Zinc	5.30	mg/kg
B2	Barium	107	mg/kg
	Calcium	397	mg/kg
	Iron	5.88	mg/kg
	Magnesium	17.6 U	mg/kg
	Sodium	92.400	mg/kg
	Thallium	17.7	mg/kg
	Zinc	2.08	mg/kg
	Sulfate	ND (1,000)	ppm
	Carbonate	184,500	ppm
	Bicarbonate	22,200	ppm
B3	Barium	1,830	mg/kg
	Calcium	214,000	mg/kg
	Chromium	0.544	mg/kg
	Iron	1,440	mg/kg
	Magnesium	11,900	mg/kg
	Potassium	22,100	mg/kg
	Sodium	299	mg/kg
	Zinc	21.8	mg/kg
	Sulfate	ND (1,000)	ppm
	Carbonate	33,508	ppm
	Bicarbonate	905,600	ppm

Values reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
ND (1,000) Constituent not detected above the laboratory reporting limit shown in parentheses.
U Sample positive result was qualified as undetected because the positive result was less than 5 times the reported method blank concentration.

Carbonate (ranged from 33,508 to 184,500 ppm) and bicarbonate (ranged from 22,200 to 905,600 ppm) were present in all three samples. No sulfate was detected above the laboratory reporting limit in either sample B2 or B3. Barium was detected in all three samples, with concentrations ranging from 39.6 mg/kg in B1 to 1,830 mg/kg in B3.

One of several rock powder waste piles located along the road south of the mill building (Figure 5) was field screened for potential presence of hydrogen cyanide by ERRS using a Macherey-Nagel Visocolor ECO Cyanid Test kit. ERRS determined that the piles were of the same waste material along the road. ERRS tested the pile located south of the former dry room concrete pad and reported to START that the test results were inconclusive.

X-ray Fluorescence Screening and Results

On the morning of October 29, 2002, START was tasked to conduct surface soil screening using a field portable Niton Model 702 Multi Element Bulk Sample Analyzer by FPXRF for metals concentrations in the area south of the wooden shed platform (Figure 5). During the EPA 2001 Site Investigation, laboratory analysis of surface soil in the area indicated the presence of cadmium and lead concentrations exceeding MTCA method A soil cleanup levels for unrestricted land uses (Ecology 2001a). The highest concentrations detected were lead (2,190 mg/kg) and cadmium (129 mg/kg) (USEPA 2002). Soil screening was conducted only in the EPA 2001 identified area to delineate the contaminated surface soil for possible mitigation during the removal action. No other suspected areas were investigated as part of this action.

Nineteen surface soil locations were screened according to EPA Method 6200 and following the FPXRF manufacturer's standard operating procedures (USEPA 1998). The instrument was placed directly onto the ground surface using a protective shield to determine metals concentrations within the top 6 inches below ground surface (bgs) at each location. Concentrations of metals of concern (lead, arsenic, chromium, manganese, mercury, and zinc) were recorded on data collection sheets at the time of measurement. Cadmium could not be analyzed by the model FPXRF used. FPXRF screening data collection sheets are provided in Appendix F.

The first three screening results were instrument self-calibration (XRF 1, XRF 2) and the calibration standard #2711 (XRF 3). All locations were chosen based on surface soil material, ability to dig, location relative to structures, and ongoing removal action activities. Locations XRF 4 through XRF 7 were collected between the wooden shed platform and the equipment warehouse pad at approximately 10 foot spacing, along the center of the south end of the wooden shed platform. XRF 8 and XRF 9 were collected approximately 10- and 8-inches below XRF 4 and XRF 5, respectively. XRF 10 through XRF 15 were collected using the same approximate spacing between the east end of the wooden shed platform and the secondary crusher building. XRF 15 through XRF 17 were collected within 25 feet of the north end of the wooden shed platform and XRF 18 and XRF 19 were collected within 30 feet of the west end of the wooden shed platform. XRF 14 and XRF 17 were collected approximately 6-inches below XRF 13 and

XRF 16, respectively. A summary of screening results is provided in Table 11 below. All locations exceeded one or more MTCA soil cleanup levels, except XRF 8.

Table 11. Summary of FPXRF screening results at the Anderson-Calhoun Mine/Mill site (mg/kg).

XRF ID Number	Arsenic	Chromium	Lead	Manganese	Mercury	Zinc
MTCA soil cleanup levels for unrestricted land use	*20* [a]	*2,000* [a, b]	*250* [a]	*11,200* [c]	*2* [a]	*24,000* [c]
XRF 4	<LOD	874	**1,030**	727	<LOD	**66,700**
XRF 5	<LOD	1,130	**650**	<LOD	<LOD	**46,500**
XRF 6	<LOD	699	**802**	<LOD	<LOD	**58,600**
XRF 7	<LOD	1,520	**619**	614	<LOD	**24,600**
XRF 8	<LOD	1,520	154	<LOD	<LOD	9,980
XRF 9	<LOD	**2,020**	147	<LOD	<LOD	11,300
XRF 10	<LOD	1,020	**841**	<LOD	**51**	20,500
XRF 11	<LOD	913	**1,060**	<LOD	<LOD	**39,700**
XRF 12	<LOD	1,190	**687**	<LOD	<LOD	**36,400**
XRF 13	<LOD	**3,440**	**1,270**	<LOD	**136**	**124,000**
XRF 14	<LOD	**2,070**	**1,670**	<LOD	<LOD	**58,800**
XRF 15	<LOD	**3,700**	**2,980**	1,150	<LOD	**60,800**
XRF 16	**153**	**3,220**	**1,700**	<LOD	<LOD	**52,300**
XRF 17	**75.7**	**3,070**	**259**	<LOD	<LOD	5,930
XRF 18	<LOD	**2,560**	**1,420**	<LOD	<LOD	**61,000**
XRF 19	<LOD	1,750	**1,090**	<LOD	<LOD	**41,300**

Notes:
Values reported in milligrams per kilogram (mg/kg).
Values in **boldface** type exceed MTCA method A or B soil cleanup levels for unrestricted land uses.
[a] – MTCA method A soil cleanup level (Ecology 2001a).
[b] – Value for chromium species III; XRF value reported is for total chromium.
[c] – MTCA method B soil cleanup level (Ecology 2001b).
LOD – Value measured was less than the instrument limit of detection.

Transformer T21 Spill Incident

On October 28, 2002 in the late afternoon, a crane truck accidentally toppled over while dismounting pole-mounted transformer T21 (filled with approximately 44 gallons of suspected PCB-contaminated oil), dumping the transformer and releasing oil to the slope below. The incident occurred because the outriggers had not been deployed before moving the transformer. The accident was reported to the OSC and Ecology the following day. A small release of oil (estimated 2 gallons) from another pole-mounted transformer in the same area (T20) also occurred on the morning of October 29. Removal of pole-mounted transformers was then halted briefly by the OSC and START, and a revised work plan implemented to drain oil from all remaining pole-mounted transformers before dismounting them from the power poles and

platforms. Between October 29 and November 2, 2002, the affected area on the slope was excavated using a large track hoe and hand shovel. Oil-contaminated soil and rock excavated from the affected area (estimated 10 cubic yards) was treated as PCB-contaminated, temporarily stockpiled on a visqueen-covered area located at the upper hopper staging area, and subsequently loaded into a 20 cubic yard roll-off box on November 2. The oil-contaminated soil was transported to the Burlington Environmental, Inc. facility in Kent, Washington for land disposal. START collected one confirmation soil sample from the excavated area, as well as oil samples from transformers T20 and T21 for laboratory analysis. The excavated area on the hill slope then was backfilled using clean soil and rock material from an on-site source.

The soil sample SPILL and three oil samples (T21, T19/T20, and T19) were analyzed for PCBs using U.S. EPA Method 8082. In addition, the soil sample was analyzed for total petroleum hydrocarbons in the diesel and heavier-than-diesel range using Ecology method NWTPH-Dx. Analytical results indicated no PCBs detected above laboratory reporting limits in all four samples, and no diesel-, mineral oil-, or lube oil-range hydrocarbons were detected above laboratory reporting limits in the confirmation soil sample SPILL (Table 12).

Table 12. PCB and TPH results of confirmation oil and soil samples (mg/kg) collected from transformers T19, T20, and T21, and the T21 spill site, Anderson-Calhoun Mine/Mill site.

Sample Identification	Polychlorinated Biphenyls	Diesel-range Hydrocarbons	Mineral Oil-range Hydrocarbons	Lube Oil-range Hydrocarbons
Oil Samples				
T19	ND (1.0)	NA	NA	NA
T19/T20	ND (1.0)	NA	NA	NA
T21	ND (1.0)	NA	NA	NA
Soil Sample SPILL	ND (0.05)	ND (10.0)	ND (25.0)	ND (25.0)

ND (1.0) Constituent not detected above laboratory reporting limit shown in parentheses.
NA Sample not analyzed for this constituent.

Materials and Disposal

Waste streams were determined by conducting hazard categorization analysis on drum and container contents, as well as transformer oil laboratory analysis. Based on field observations and analysis, similar wastes were bulked and/or prepared for transportation to a hazardous waste disposal facility. Transportation of all waste material was provided by Philip Environmental Services, Inc. of Renton, Washington. Waste disposal manifest tickets are provided in Appendix G. Table 13 summarizes waste streams and final disposal information for materials removed from the site.

The following methods were used to dispose waste streams during the removal action:

- Crushed drums, PPE, and miscellaneous debris were loaded into two dump trucks with pup trailers for transport offsite to the Chemical Waste Management, Inc. facility (Columbia Ridge Landfill) in Arlington, Oregon for land disposal. Class 9 waste material, including grease and sludge identified in drums (estimated amount less than 10 percent) across the site, also was disposed with these materials. Characterization was based on field hazard categorization.

- Bulk flammable liquids from drums and oil from transformers and electrical equipment containing less than 50 ppm PCBs identified across the site were vacuumed into two 5,000-gallon tanker trucks for transport offsite to the Burlington Environmental, Inc. facility in Tacoma, Washington for incineration. Empty transformer carcasses were placed in 22 DOT secondary containment boxes for transport offsite to the Burlington Environmental, Inc. facility in Kent, Washington for scrap metal recycling. Characterization was based on field hazard categorization and removal evaluation analytical results.

- Oil from transformer T22 containing greater than 50 ppm PCBs was drained into three overpack 55-gallon drums for transport offsite to the Burlington Environmental, Inc. facility in Kent, Washington for incineration. Characterization was based on removal evaluation analytical results.

- Water and diesel mixtures from the diesel UST were vacuumed into one of the two tanker trucks for transport offsite to the Burlington Environmental, Inc. facility in Tacoma, Washington for incineration and fuel recycling. Characterization was based on removal evaluation analytical results.

- Water, diesel, and greasy sludge mixtures from drums and containers identified across the site were packaged into 12 overpack drums for transport offsite to the Burlington Environmental, Inc. facility in Tacoma, Washington for incineration.

Table 13. Waste disposal summary for the Anderson-Calhoun Mine/Mill Removal Action located in Leadpoint, Washington.

Waste Stream	Profile	Manifest	Container ID	Estimated Quantity	Disposal Location/Method
Crushed drums and Class 9 waste material	0563CW-00	80229-02 and 80230-02	Two dump trucks and pup trailers	27,280 pounds	Chemical Waste Management Inc., Columbia Ridge Landfill, Arlington, Oregon/Land disposal
Bulk flammable liquids (waste oil, diesel, petroleum naphtha)	310451-00 and 310453-00	80290	5,000-gallon tanker truck - Drums #1 through #3, #21, #38, #39, #47, #53, #54, #98 through #114, #121, #124, #125, #129, and #130	2,500 gallons	Burlington Environmental, Inc., Tacoma, Washington/Incineration
Water and diesel mixture	310629-00	80220-02	5,000-gallon tanker truck - diesel UST	4,500 gallons	Burlington Environmental, Inc., Tacoma, Washington/Incineration and fuel recycling
Water with diesel and greasy sludge	310629-00	80295-02 (line 1B)	12 overpack drums - Drums #4, #12 through #21, #22, #23, #55, #57, #58, #115 through #119, #120, #122, and #123	600 gallons	Burlington Environmental, Inc., Tacoma, Washington/Incineration
Petroleum grease	41060-45-00	80295-02 (line 2C)	2 overpack drums - Drums #24 and #25	1,000 pounds	Chemical Waste Management Inc., Columbia Ridge Landfill, Arlington, Oregon/Land disposal
Mineral oil from transformer <500 ppm PCBs	310456-00	80296-02 (line 1B)	Three overpack drums - T22	578 kilograms	Burlington Environmental, Inc., Kent, Washington/Incineration
Transformer carcasses	310519-00	80296-02 (line 1A) and 80401K (line 1B)	22 DOT secondary containment boxes - Transformers T1 through T9, T11, T12, T16, T17, T19 through T21, T23 through T28, and T37 through T42	16,535 pounds	Burlington Environmental, Inc., Kent, Washington/Scrap metal recycling

Table 13. Waste disposal summary for the Anderson-Calhoun Mine/Mill Removal Action located in Leadpoint, Washington (continued).

Waste Stream	Profile	Manifest	Container ID	Estimated Quantity	Disposal Location/Method
Corrosive liquids (sodium hydroxide)	310452-00	80295-02 (line 1A) and 80401-02 (line 1A)	65 overpack drums - Drums #27, #29 through #37, #46, #48 through #51, #56, #59 through #97, and #131 through #150	3,250 gallons	Burlington Environmental, Inc., Tacoma, Washington/Neutralization
Corrosive solids (sodium hydroxide)	310452-00	80296-02 (line 1C)	9 overpack drums - Drums #40 through #45	3,000 pounds	Burlington Environmental, Inc., Kent, Washington/Neutralization
Sulfuric and hydrochloric acid mixture	310632-00	80296-02 (line 1D)	1 overpack drum - Drum #28	50 gallons	Burlington Environmental, Inc., Kent, Washington/Neutralization
Lead acid batteries	310699-00	80296-02 (line 2B)	1 pallet load - 18 batteries	80 pounds	Burlington Environmental, Inc., Kent, Washington/Neutralization
Soil contaminated with <50 ppm PCBs from transformers	310633-00	80292	One roll-off container - oil-contaminated soil from T21 release site	10 cubic yards	Chemical Waste Management Inc., Arlington, Oregon/Land disposal in hazardous waste landfill
Used PPE, visqueen contaminated with sodium hydroxide debris and low levels PCBs	311056-00	80401K (line 1C and 1D)	1 DOT secondary containment box and 1 overpack drum	300 pounds	Chemical Waste Management Inc., Columbia Ridge Landfill, Arlington, Oregon/Land disposal

- Petroleum grease from drums #24 and #25 was placed into two overpack drums for transport offsite to Columbia Ridge Landfill in Arlington, Oregon for land disposal. Characterization was based on field hazard categorization results.

- Corrosive (basic) liquids, including waste sodium hydroxide solution located mainly inside the northeast corner of the mill building, were packaged into 65 overpack drums for transport offsite to the Burlington Environmental, Inc. facility in Tacoma, Washington for neutralization. Characterization was based on field hazard categorization and removal evaluation analytical results.

- Corrosive (basic) solids, including sodium hydroxide pellets located inside the northeast corner of the mill building, were packaged into nine overpack drums for transport offsite to the Burlington Environmental, Inc. facility in Kent, Washington for neutralization. Characterization was based on field hazard categorization results and field observations.

- A sulfuric and hydrochloric acid mixture, located in one 55-gallon drum on a pallet staged on the former maintenance repair shop building foundation pad, was packaged in one 55-gallon drum for transport offsite to the Burlington Environmental, Inc. facility in Kent, Washington for neutralization. Characterization was based on field hazard categorization and removal evaluation analytical results.

- Waste flammable liquids and solids (i.e., methanol, benzene solvent, acetone, toluene) from bottles and jars collected at the assay lab dump site were consolidated in a 5-gallon plastic bucket containing Solidisorb material. The bucket was overpacked along with other bulk flammable liquids and debris for transport offsite to the Burlington Environmental, Inc. facility in Kent, Washington for incineration. Characterization was based on field hazard categorization results.

- Lead-acid car and truck batteries, a majority located in the vicinity of the former dry room and on the wooden shed platform, were packaged on a plastic-lined pallet for transport offsite to the Burlington Environmental, Inc. facility in Kent, Washington for neutralization and recycling. Characterization was based on field observations.

- Oil-contaminated soil from the transformer T21 oil release site was transported to the Chemical Waste Management, Inc. hazardous waste landfill in Arlington, Oregon for land disposal. Soil was removed using an excavator and loaded into one visqueen-lined roll-off container for transportation from site. Characterization was based on confirmation analytical results of oil samples collected from transformers T20 and T21.

Potentially Responsible Party Search

Information regarding the potentially responsible party search is found in the confidential enforcement addendum (Appendix I).

Health and Safety

Weather conditions, heavy equipment operation, and chemical exposure were the major health and safety concerns during the removal action. The following briefly describes these concerns and actions taken to minimize potential impacts:

- Temperature extremes—Temperatures as low as 0° F were encountered during the removal action. In order to minimize cold exposure, workers were encouraged to wear appropriate clothing and to monitor their own condition and that of their coworkers; vehicles were available for use as warm-up areas; and site personnel were informed daily during health and safety meetings of cold exposure symptoms, to take adequate breaks, and to drink sufficient quantities of fluids. As a result of these precautions, no cold exposure problems occurred.

- Chemical exposure—To minimize potential exposures to chemicals and biological hazards, site workers donned level B personal protective equipment, including splash resistant Tyvek® suits, protective gloves, and self-contained breathing apparatus while opening drums and performing hazard categorization. Personnel donned level B personal protective equipment, including splash resistant Tyvek® suits, protective gloves, and air purifying respirators while draining and sampling transformers, while transporting and bulking materials, and while collecting confirmation samples. Worker breathing zones were monitored for carbon monoxide, hydrogen sulfide, oxygen, and explosive atmosphere using a four-gas monitor, and for hydrogen cyanide using a hydrogen cyanide monitor. A photo-ionization detector was available for monitoring volatile organic compounds; however, the cold temperatures prevented any significant volatilization of materials. As a result of these precautions and monitoring procedures, chemical exposures were minimized.

- Heavy machinery operations—During daily health and safety meetings, planned activities were discussed, including equipment work zones. Workers were reminded to stay out of the way of equipment, maintain visual contact with the operator, and to wear hard hats while working around excavators and boom trucks. One incident involving a crane truck occurred while the truck was removing a transformer from a pole-mounted platform. The front outriggers were not deployed before moving the

transformer, and subsequently the truck tipped over on its side during the process. No injuries related to this incident were reported.

- Biological and physical hazards—Where possible, physical hazards were removed to prevent slip, trip, and fall accidents and work was conducted using the buddy system. Due to the cold temperatures no insects or reptiles were active during the removal activities. No injuries resulted from biological or physical hazards.

Resources Committed

	Estimated Costs to Date
EPA	$ 8,175
START	$ 43,110
ERRS	$109,000
TOTAL	$160,175

Note: The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

Difficulties Encountered

Difficulties encountered during the removal action that impacted total costs and time spent on the Anderson-Calhoun Mine/Mill Removal Action include the following:

- A total of 232 drums and containers were identified, evaluated, and removed from the site, including 146 containing unknown liquids or solids. This was more than twice the number of drums previously estimated during the preliminary site assessment (100 drums).
- A total of 48 transformers and other oil-filled electrical equipment were identified, evaluated, and the majority removed from the site. This was more than twice the number of transformers and other electrical equipment previously estimated during the preliminary site assessment (18).
- The assay lab dump and powder house were not previously identified in earlier site assessments. Information gathered from the county assessor's office and title company was necessary to determine whether the dump site was located on mine or private property, and if right of access agreements signed by private property owner(s) were required prior to removal. Additional assessment also was necessary to determine health and safety issues associated with the potential presence of picric acid and other explosive chemicals typical of mine waste sites, and determine appropriate removal and disposal requirements.
- An accidental spill of transformer oil from T21 occurred near the end of the first day of the removal action. Cleanup of the T21 oil release site required additional oversight, documentation, and sampling by START. Additional ERRS labor and equipment was necessary for the cleanup and additional costs for disposal of oil-contaminated soil excavated from the release site were incurred.
- The OSC changed the EQM project manager after the spill incident. Project logistics and work activities had to be re-communicated to the new EQM project manager, who at the time, also was managing another removal action in Colville, Washington.
- Interview results from (b) (6) regarding recent on-site cattle deaths associated with possible ingestion of white crystalline waste piles across the site. Additional research, sampling, and analysis were necessary to evaluate whether barium carbonate was present in these piles and its potential toxicity and impact to human health and the environment.

Due to the discoveries and difficulties stated above, the scope and duration of the response was greater than envisioned, requiring additional field time spent for documenting, field screening, sampling, validating, and evaluating analytical data; the oversight, documentation, and sampling for the cleanup of T21 release site; researching mine property boundaries and information on barium carbonate; and costs associated with additional laboratory analysis.

Conclusions

On October 27, 2002, the START, EPA, and ERRS contractors mobilized to the Anderson-Calhoun Mine/Mill site to conduct a removal action in Leadpoint, Washington.

START conducted oversight activities from October 28 through November 2, 2002, including documentation of site activities in field logbooks, and with 35-millimeter photographs and video tapes; conducted oversight of field hazard categorization analysis; conducted health and safety monitoring for on-site workers; conducted field screening for metal concentrations by FPXRF; collected product samples from drums and containers based on field hazard categorization results and oil samples from transformers and other oil-filled electrical equipment for confirmation laboratory analysis; and conducted oversight of removal, bulking, transportation, and disposal of waste material.

Project activities included:

- Removal and offsite disposal of drums and containers containing hazardous substances
- Removal and offsite disposal of drums and containers containing non-hazardous substances
- Removal and offsite disposal of water contaminated with diesel fuel and other flammable liquids contained in the diesel UST
- Removal and offsite disposal of oil contained in transformers and other electrical equipment, as well as transformer carcasses after being drained of oil
- Removal and offsite disposal of chemicals contained in bottles and jars associated with the assay lab dump
- Sample collection, laboratory analysis, and assessment of white crystalline material from waste piles identified across the site
- Excavation and offsite disposal of oil-contaminated soil from the T21 release area

Total volume of waste materials removed from the site included:

- 27,280 pounds of crushed drums and Class 9 waste material
- 2,500 gallons of flammable liquid and transformer oil contaminated with less than 50 ppm PCBs

- 5,100 gallons of diesel fuel, transformer oil contaminated with less than 50 ppm PCBs, greasy sludge, and water mixtures
- 1,000 pounds of petroleum grease
- 578 kilograms of transformer oil contaminated with less than 500 ppm PCBs
- 16,535 pounds of transformer carcasses (drained of oil)
- 3,250 gallons and 3,000 pounds of corrosive base liquids and solids
- 50 gallons of sulfuric and hydrochloric acid mixture
- 80 pounds of lead-acid batteries
- 10 cubic yards of oil-contaminated soil
- 300 pounds of used PPE, visqueen contaminated with sodium hydroxide and low level PCB debris.

All materials observed in drums, containers, and the UST were removed from the site for disposal, mitigating the potential for future release to the environment. The UST may have previously contained diesel and possibly other flammable liquids used for operating equipment associated with mining operations. All transformers and other electrical equipment left on-site were drained of oil, which was bulked with other flammable liquids for disposal, reducing the potential for release from these equipment.

Following site removal activities, Fritz Wolff of the Washington State Department of Natural Resources, Abandoned Mine Lands Project, told the START that he had observed the white crystalline piles on a previous visit and noted the label for sodium silicate on a number of the deteriorated sacks. He stated that the white crystalline material on adjacent pallets were distinctly different from materials in the paper sacks and strongly resembled sodium carbonate, a reagent widely used in flotation mills for controlling pH. He noted that the white crystalline material appeared similar to materials collected and analyzed from another mine site, with the results strongly indicating sodium carbonate or bicarbonate (Wolff personal communication 2002).

(b) (6) believes that cattle lick the material because it tastes salty. The mineral barite, including the ore imported to the mill site in the early 1980s, consists of barium sulfate (Hurlbut 1971). Barium sulfate is commonly used by oil and gas industries as weighted drilling mud (Lewis 1997). Barium carbonate is found in nature as the mineral witherite, and is used as an ingredient in rat poison, among other products (Lewis 1997).

Analytical results for the three white crystalline waste piles indicated low concentrations of barium and high concentrations of carbonate/bicarbonate detected; no sulfate was detected. The

potential for each waste pile to be contaminated with other materials was high (i.e. sodium carbonate) and therefore, it is difficult to determine whether the detected barium and carbonate concentrations were elevated enough to suggest the presence of barium carbonate in each waste pile or pose a potential environment hazard. To confirm toxicity of the material, bioassay testing would be required.

Further assessment or removal are warranted, as follows:

- Determine the nature and extent of soil contamination including: locations previously identified during the 2001 site investigation such as the evaporation/settlement pond and tailings piles; beneath and near all ground transformers and associated pads with PCB concentrations greater than 1 ppm; assay lab dump and debris pile; oil-stained area southeast of the mill building near the former empty drum stockpile.

- Determine the nature and extent of potential sediment and surface water contamination in wetland and other surface water features such as the North Fork Deep Creek, drainage ditches, and water-filled mine pits.

- Determine the nature and extent of potential subsurface soil and groundwater contamination associated with the estimated 10,000 gallon underground storage tank.

- Evaluate the water-filled upper and lower mine pits for potential contamination, including the presence of oil-filled electrical equipment such as transformers.

- Determine the biotoxicity of the several white crystalline waste piles and similar material found within the silo.

In addition to the preceding environmental concerns, there is a physical hazard associated with unrestricted access to the site such as the water-filled mine pits and dilapidated buildings. Therefore, recommend that the current owner take whatever precautions deemed appropriate to protect the public against such hazards.

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APPENDIX A

Waste Stream Inventories—Drums and Containers

HERRERA ENVIRONMENTAL CONSULTANTS

DRUM/CONTAINER INVENTORY RECORD

Date October 28, 2002
Project Name LEADPT
Project No. C00-01732-032
TDD No. 02-10-0006

Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
1	11	55	75 *	steel	blue	open	no label	Waste oil/flammable	SE of Mill Building/ on pallet with #2/ soil stained beneath drum
2	11	55	75 *	steel	black	bung	no label	Waste oil/flammable	SE of Mill Building/ on pallet with #1/ soil stained beneath drum
3	11	55	50 *	steel	blue	open	no label	Waste oil/flammable	SE of Mill Building/ soil stained beneath drum
4	12	55	50 *	steel	black	bung	no label	Liquid/water	SE of Mill Building/ on its side/bottom of drum bulge
5	12	5	50 *	steel	blue	open, pail	no label	Sludge/Class 9	SE of Mill Building, near #4/on its side with no lid
6	12	5	50 *	steel	blue	open, pail	no label	Sludge/Class 9	SE of Mill Building, near #4
7	13, 14	30	30	steel	white, blue, red	open	Mobil logo label	Tan-colored sludge and water/Class 9	SE of Mill Building/ no lid and dented on side
8	15	5	50 *	steel	white	open, liquid pail	RPM Spray N Stay gear lubricant	Sludge/Class 9	Next to debris pile, SE of Mill Building/dented
9	15	5	50 *	steel	blue	open	Chevron logo label; ?AVI-MOTIVE Grease	Sludge/Class 9	Next to debris pile, SE of Mill Building
10	16	55	80	steel	blue, rusted	open	no label	Light gray rock powder/Class 9	Next to debris pile, SE of Mill Building/on its side with contents spilling out, no lid
11	16	55	80	steel	blue, rusted	open	no label	Light gray rock powder/Class 9	Next to debris pile, SE of Mill Building/on its side with contents spilling out, no lid

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12	17, 18	55	50 *	steel	blue	open	Chevron logo label	Sludge/Class 9	Next to wooden platform/on its side with lid next to it; contents (sludge) on ground
13	17, 18	55	30 *	steel	white, rusted	open	Mobil logo, lubricating grease	Brown gelatinous substance—sludge/ Class 9	On wooden platform/on its side with no lid, next to pallets of white crystalline material
14	17, 18	5	60	steel	light green	open, paint can/pail	label covered with red-colored substance	Hardened red-colored substance (possibly dried paint)—sludge/ Class 9	On wooden platform
15	17, 18	5	50 *	steel	light gray	open, paint can/pail	no label	Sludge/Class 9	On wooden platform
16	17, 18	5	50 *	steel	rusted	closed, liquid spout	Partial label--?EXRON II Fluid	Sludge/Class 9	On wooden platform
17	17, 18	5	75	steel	black	open, paint can/pail	NAPA, Martin Senour Sealers, Body undercoating & deageners	Black-colored sludge/ Class 9	On wooden platform
18	17, 18	5	50 *	steel	black, rusted near lid	open, paint can/pail	Partial label—?Soap Company	Sludge/Class 9	On wooden platform
19	17, 18	5	50 *	steel	white	open, paint can/pail	Conoco logo, gear lubricant	Sludge/Class 9	On wooden platform
20	17, 18	55	75 *	steel	rusted, light green	closed	National Chem Search	Sludge/Class 9	On wooden platform/on its side, bottom of drum bulged
21	17, 18	55	100 *	steel	black	bung	Stenciled label—Aero Promoter	Oil and water/ flammable	On ground next to wooden platform
22	19	5	75 *	steel	light green	open, paint can/pail	no label	Sludge/Class 9	On wooden platform

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23	19	5	75 *	steel	black	open, paint can/pail	no label	Sludge/Class 9	On wooden platform
24	20	55	100	steel	rusted, possibly black	bung	Chevron logo, grease	Oil/flammable	On drum rack N of Mill Building/ on its side, next to #25
25	20	55	100	steel	rusted, possibly black	bung	Chevron logo, label gone	Oil/flammable	On drum rack N of Mill Building/ on its side, next to #24
26	21	5	75	steel	rusted, blue	bung	no label	Light gray rock powder	Lower hopper/large crusher area/ rusted through, on its side with light gray granular material spilling out
27	21	55	75 *	steel	black	bung	Silicate of soda	Liquid/caustic	Lower hopper/large crusher area/ drum inside hopper, on its side
28	22, 33, 45, D4	55	75	plastic-lined steel	black, white top	bung	no label	Dark green-colored liquid/acid	Maintenance/Repair Shop concrete building pad/on pallet with #29
29	22, 33, D4	55	35	steel	black, rusted top	bung	no label	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #28
30	22, 33, D4	55	50	steel	black	no lid (possible bung), top covered with black plastic sheeting held in place with flat metal cable tie	no label	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #31
31	22, 33, D4	55	50	steel	black, rusted top	bung	no label	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #30

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32	22, 33, D4	55	60	steel	black, white/rusted top	bung	no label	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #33 and 34
33	22, 33, D4	55	50	steel	black, white/rusted top	bung	label worn off, hard to read	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #32 and 34
34	22, 33, D4	55	55	steel	black, rusted top	bung	no label	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #32 and 33
35	22, 33, D4	55	100	steel	black, white top	bung	no label	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #36 and 37, dented on top with slight bulge
36	22, 33, D4	55	75	steel	black, white top	bung	no label	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #35 and 37
37	22, 33, D4	55	100	steel	black, white/rusted top	bung	no label	Liquid/caustic	Maintenance/Repair Shop concrete building pad/on pallet with #35 and 36, dented on side near top with slight bulge
38	D6	55	30 *	steel	blue	bung	no label	Liquid/flammable	NE corner inside Mill Building, near stairs leading to cat walk and circuit breakers/switches
39	D6	55	30 *	steel	blue	bung	label worn off, hard to read	Liquid/flammable	NE corner inside Mill Building, near stairs leading to cat walk and circuit breakers/switches

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40	D6	55	75 *	steel	black	open	PELS, caustic soda beads—sodium hydroxide	Powder (beads)/ caustic	NE corner inside Mill Building on pallet against east wall with #41 to 45/bullet holes on side of drum
41	D6	55	75 *	steel	black	open	PELS, caustic soda beads—sodium hydroxide	Powder (beads)/ caustic	NE corner inside Mill Building on pallet against east wall with #40 and 42 to 45/bullet holes on side of drum
42	D6	55	75 *	steel	black	open	PELS, caustic soda beads—sodium hydroxide	Powder (beads)/ caustic	NE corner inside Mill Building on pallet against east wall with #40, 41 and 43 to 45/bullet holes on side of drum
43	D5, D6	55	100	steel	black	open	sodium hydroxide	Powder (beads)/ caustic	NE corner inside Mill Building on pallet against east wall with #40 to 42 and 44 to 45
44	D5, D6	55	100	steel	black	open	sodium hydroxide	Powder (beads)/ caustic	NE corner inside Mill Building on pallet against east wall with #40 to 43 and 45
45	D5, D6	55	100	steel	black	open	sodium hydroxide	Powder (beads)/ caustic	NE corner inside Mill Building on pallet against east wall with #40 to 44
46	D5, D6	55	50 *	plastic-lined steel	rusted (possible black)	bung	no label	Liquid/caustic	NE corner inside Mill Building/ bullet holes on side
47	D5, D6	55	50 *	plastic-lined steel	black, rusted	bung	no label	Liquid (oil)/ flammable	NE corner inside Mill Building
48	D5, D6	55	75	plastic-lined steel	rusted	bung	no label	Liquid (pH = 14)/ caustic	NE corner inside Mill Building/ on pallet with #49 and 50

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49	D5, D6	55	100	plastic-lined steel	rusted	bung	no label	Liquid (pH = 14)/ caustic	NE corner inside Mill Building/ on pallet with #48 and 50
50	D5, D6	55	100	plastic-lined steel	rusted	bung	no label	Liquid (pH = 14)/ caustic	NE corner inside Mill Building/ on pallet with #48 and 49
51	D5, D6	55	75	plastic-lined steel	rusted, black	bung	no label	Liquid (pH = 11)/ caustic	NE corner inside Mill Building/ drum crushed
52	D5, D6	55	empty	plastic-lined steel	rusted, black	bung	no label	empty	NE corner inside Mill Building/ drum crushed
53	D5	55	25	plastic-lined steel	rusted, black	bung	no label	Liquid (oil)/ flammable	NE corner inside Mill Building/ bullet holes on side of drum
54	D5	55	80 *	steel	rusted	bung	no label	Liquid (oil)/ flammable	NE corner inside Mill Building
55	D5	55	50	plastic-lined steel	black	bung	no label	Frozen liquid (ice; pH = 7)	NE corner inside Mill Building
56	D5	55	75	steel	black	bung	no label	Liquid (pH = 10)/ caustic	NE corner inside Mill Building
57	D5	55	50	steel	blue	open	no label	Frozen clear liquid (ice)	NE corner inside Mill Building/ no lid present
58	D5	55	35	steel	blue	open	no label	Frozen clear liquid (ice)	NE corner inside Mill Building/ no lid present
59	D6, D7	55	40 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
60	D7	55	50 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes

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61	D7	55	30 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
62	D7	55	20 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
63	D7	55	30 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
64	D7	55	10 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
65	D7	55	40 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
66	D7	55	30 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
67	D7	55	30 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
68	D7	55	30 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
69	D7	55	30 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes

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70	D7	55	30 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
71	D7	55	20 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
72	D5, D7	55	10 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
73	D7	55	50	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums/ bullet holes
74	D7, D9	55	10	plastic-lined steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums
75	D7, D9	55	50	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums
76	D7, D9, D10	55	40	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums
77	D7, D8, D9, D10	55	40 *	steel	black	bung	no label; white label with "Lot No. 190- James G. Murphy, Inc. Auctioneers, Kenmore, WA"	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums/ bullet holes

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78	D9, D10, D11	55	40 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
79	D9, D10, D11	55	20 *	steel	black	bung	Silicate of soda	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
80	D9, D10, D11	55	30 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
81	D9, D10, D11	55	50 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
82	D9, D10, D11	55	50 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row/bullet holes
83	D9, D10, D11	55	100 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row
84	D9, D10, D11	55	100 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row
85	D9, D10, D11	55	30 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
86	D9, D10, D11	55	40 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes

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Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
87	D9, D10, D11	55	20 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
88	D9, D10, D11	55	30 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/bullet holes
89	D9, D10, D11, D14	55	10 *	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, bottom row/white, translucent solidified liquid spilled out of bullet hole near bottom of drum
90	D9	55	80	steel	black	bung	no label	Liquid (solidified due to below-freezing temp.)/base	NE corner inside Mill Building, large center collection of drums, top row front
91	48, D10, D12, D13	55	100	steel (plastic-lined?)	black	bung	Stenciled label—Aero Promoter	Liquid/base	NE corner inside Mill Building, large center collection of drums
92	48, D10, D12, D13	55	100	steel (plastic-lined?)	black	bung	Stenciled label—Aero Promoter	Liquid/base	NE corner inside Mill Building, large center collection of drums
93	48, D12	55	100	steel (plastic-lined?)	black	bung	Stenciled label—Aero Promoter	Liquid/base	NE corner inside Mill Building, large center collection of drums
94	48, D12	55	100	steel (plastic-lined?)	black	bung	Stenciled label—Aero Promoter	Liquid/base	NE corner inside Mill Building, large center collection of drums

HERRERA ENVIRONMENTAL CONSULTANTS

DRUM/CONTAINER INVENTORY RECORD

Date October 28, 2002
Project Name LEADPT
Project No. C00-01732-032
TDD No. 02-10-0006

Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
95	48, D12	55	100	steel (plastic-lined?)	black	bung	Stenciled label—Aero Promoter	Liquid/base	NE corner inside Mill Building, large center collection of drums
96	D12	55	100	steel (plastic-lined?)	black	bung	Stenciled label—Aero Promoter	Liquid/base	NE corner inside Mill Building, large center collection of drums
97	D12	55	100	steel (plastic-lined?)	black	bung	Stenciled label—Aero Promoter	Liquid/base	NE corner inside Mill Building, large center collection of drums
98	D10, D12	55	50	steel (plastic-lined?)	black	bung	no label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums
99	D7, D10, D12	55	25	steel (plastic-lined?)	black	bung	no label	Liquid (pH = 7)/ flammable	NE corner inside Mill Building, north of large center collection of drums
100	D10, D13	55	40	steel (plastic-lined?)	black	bung	no label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums
101	D10	55	90 *	steel	black	bung	no label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums/on its side
102	D10, D13, D15	55	100 *	steel	aqua blue	bung	label worn off—can not read label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums
103	D13	55	100 *	steel	black or dark blue	bung	label worn off—can not read label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums/on its side

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TDD No. 02-10-0006

Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
104	D15	55	40 *	steel	aqua blue	bung	no label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums/on pallet with #105 and 106
105	D15	55	50 *	steel	aqua blue	bung	no label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums/on pallet with #104 and 106
106	D15	55	100 *	steel	aqua blue	bung	no label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums/on pallet with #104 and 105
107	D13, D15	55	60	steel	black or dark blue	bung with center bung	Super Floc 1— (polyacrylamide in water in oil emulsion) American Cyanamide Company	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums
108	D13, D15, D16	55	50	steel	black or dark blue	bung with center bung	no label (drum appeared similar to 107)	Liquid (pH = 6)/ flammable	NE corner inside Mill Building, north of large center collection of drums/on pallet with bullet hole near bottom of drum and opaque, partially solidified material spilled out of bullet hole
109	D13	55	30	steel	black or dark blue	bung with center bung	no label (drum appeared similar to 107)	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums
110	D13	55	60	steel	black or dark blue	bung with center bung	Super Floc 1	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums
111	D13	55	100	steel	black or dark blue	bung with center bung	Super Floc 1	Liquid (pH = 7)/ flammable	NE corner inside Mill Building, north of large center collection of drums

HERRERA ENVIRONMENTAL CONSULTANTS

DRUM/CONTAINER INVENTORY RECORD

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TDD No. 02-10-0006

Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
112	D13	55	75	steel	black or dark blue	bung with center bung	Stenciled label— Super Floc 1	Liquid (pH = 7)/ flammable	NE corner inside Mill Building, north of large center collection of drums
113	D13	55	100 *	steel	black or dark blue	bung with center bung	Super Floc 1	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums
114	D13	55	100	steel	black or dark blue	bung	no label	Liquid/flammable	NE corner inside Mill Building, north of large center collection of drums
115	D13	55	10	steel	rusted	open	no label	About 3 inches of multi-colored sludge/ Class 9	NE corner inside Mill Building, north of large center collection of drums
116	D17	55	20	steel	black	bung, top of drum half cut open	no label	Brown/black-colored sludge/Class 9	On cat walk, west side of Mill Building near flotation tanks
117	D17	55	35	steel	blue	open	no label	Brown liquid and sludge (water)/Class 9	On cat walk, west side of Mill Building near flotation tanks/ bottom of drum bulged
118	D17	55	40	steel	black	bung with center bung	label unreadable	Frozen liquid (ice)	On cat walk, west side of Mill Building near flotation tanks/ on its side
119	D17	55	10	steel	black	bung with center bung	label unreadable	Frozen liquid (ice)	On cat walk, west side of Mill Building near flotation tanks/ on its side
120	36	5	50	steel	white	open, paint can/pail	no label	Black-colored, frozen liquid (ice)/Class 9	SW corner inside Mill building

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TDD No. 02-10-0006

Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
121	37	55	50	steel	rusted, black with white top	bung	no label	Oil and water/ flammable	East of debris pile, next to pond/ on its side, drum crushed at its center, cut open
122	D37	5	75	steel	white with yellow strips	open, paint can/pail	Conoco logo label	Brown gelatinous substance/Class 9	Immediately outside south-central of Mill Building/on its side, with some of the brown substance spilling out onto ground
123	D41	3	80	steel	black	open, paint can/pail	no label	Hardened black tar-like substance/Class 9	SW of Mill Building, near base of hillslope
124	D41	1	100	steel	rusted, metal	oblong can	no label	Liquid/flammable	SW of Mill Building, near base of hillslope
125	D41	1	50	steel	rusted, metal	oblong can	no label	Liquid/flammable	SW of Mill Building, near base of hillslope/dented and crushed at top
126	D24	1	empty	steel	rusted, metal	oblong can	XYLON (flammable) label	empty	Scattered among car batteries west of pad-mounted transformers T4 to T9
127	D24	1	empty	steel	white	oblong can	no label	empty	Scattered among car batteries west of pad-mounted transformers T4 to T9
128	D24	1	empty	steel	rusted, metal	oblong can	no label	empty	Scattered among car batteries west of pad-mounted transformers T4 to T9
129	D24	1	25	steel	rusted, black/ white	oblong can	"Liquid Wrench" (flammable)	Liquid/flammable	Scattered among car batteries west of pad-mounted transformers T4 to T9
130	D24	1	100	steel	rusted, metal	open, paint can/pail	no label	Liquid/flammable	Among disposed car and truck batteries west of pad-mounted transformers T4 to T9

HERRERA ENVIRONMENTAL CONSULTANTS

DRUM/CONTAINER INVENTORY RECORD

Date October 28, 2002
Project Name LEADPT
Project No. C00-01732-032
TDD No. 02-10-0006

Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
131	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
132	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
133	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
134	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
135	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
136	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
137	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building

HERRERA ENVIRONMENTAL CONSULTANTS

DRUM/CONTAINER INVENTORY RECORD

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Project No. C00-01732-032
TDD No. 02-10-0006

Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
138	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
139	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
140	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
141	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
142	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
143	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
144	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building

HERRERA ENVIRONMENTAL CONSULTANTS

DRUM/CONTAINER INVENTORY RECORD

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Project No. C00-01732-032
TDD No. 02-10-0006

Drum/ Container ID Number	Photo ID	Capacity (gallons)	Approximate Volume (%)	Container Material	Container Color	Container Opening Type	Labels/Markings	Phase Description/ Hazard Categorization Conclusion [a]	Location/Condition/ Additional Information
145	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
146	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
147	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
148	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
149	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building
150	48, D7, D9	55	100	steel	black	bung	Silicate of soda	White translucent liquid (solidified due to below-freezing temp.)/base	Center group of drums, NE corner of Mill Building

Note:
[a] Phase description and hazard categorization conclusions were provided by ERRS.
* Indicated drum was removed prior to determining content volume. The approximate volume shown was based on visual record (e.g., video tape) and professional judgment.

APPENDIX B

Waste Stream Inventories—Transformers and Other Electrical Equipment

HERRERA ENVIRONMENTAL CONSULTANTS

TRANSFORMER/ELECTRICAL EQUIPMENT INVENTORY RECORD

Date October 28, 2002
Project Name LEADPT
Project No. C00-01732-032
TDD No. 02-10-0006

Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T1	1, 2, D25	Pad-mounted transformer	100	36	5.12	White/light gray; appeared new	Allis-Chalmer/ certified blue PCBs label < 50 ppm	SW of mill building, situated on concrete pad with T2 and T3; adjacent to electrical room	Drained of oil and removed from site
T2	1, D25	Pad-mounted transformer	100	est. 36	2.32	White/light gray; appeared new	General Electric—Spirakore/ certified blue PCBs label < 50 ppm	SW of mill building, situated on concrete pad with T1 and T3; adjacent to electrical room	Drained of oil and removed from site
T3	1, 3, D25	Pad-mounted transformer	100	36	5.12	White/light gray; appeared new	Allis-Chalmer/ certified blue PCBs label < 50 ppm	SW of mill building, situated on concrete pad with T1 and T2; adjacent to electrical room	Drained of oil and removed from site
T4	4, D24	Pad-mounted transformer	5	est. 7.5	ND (1.0)	Gray; appeared old	Line Material Co./ no PCBs label	SW of mill building, situated on concrete pad with T5 to T9; adjacent to former dry room	Drained of oil and removed from site
T5	4, D24	Pad-mounted transformer	5	7.5	ND (1.0)	Gray; appeared old	Line Material Co./ no PCBs label	SW of mill building, situated on concrete pad with T4, and T6 to T9; adjacent to former dry room	Drained of oil and removed from site
T6	4, D24	Pad-mounted transformer	5	est. 7.5	ND (1.0)	Gray; appeared old	Line Material Co./ no PCBs label	SW of mill building, situated on concrete pad with T4, T5, and T7 to T9; adjacent to former dry room	Drained of oil and removed from site

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Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T7	4, 5, D24	Pad-mounted transformer	25	20	1.93	Gray; appeared old	Westinghouse/ no PCBs label	SW of mill building, situated on concrete pad with T4 to T6 and T8 to T9; adjacent to former dry room	Drained of oil and removed from site
T8	4, 5, D24	Pad-mounted transformer	25	20	1.93	Gray; appeared old	Westinghouse/ no PCBs label	SW of mill building, situated on concrete pad with T4 to T7 and T9; adjacent to former dry room	Drained of oil and removed from site
T9	4, 5, D24	Pad-mounted transformer	25	20	1.93	Gray; appeared old	Westinghouse/ no PCBs label	SW of mill building, situated on concrete pad with T4 to T8; adjacent to former dry room	Drained of oil and removed from site
T10	6	Large pad-mounted transformer (substation)	unknown	est. 1,200	ND (1.0)	Light gray; appeared fairly new	General Electric/ no PCBs label	WNW of mill building; in the substation	Had 3 chambers, each with its own drain plug; left on-site after pumped oil out and filled chambers with clay absorbent
T11	7	Wire coil	200	no oil or fluid present	NA	Dark gray; car battery sized	General Electric/ no PCBs label	WNW of mill building; in the substation adjacent to T10 transformer	Removed from site
T12	7	Wire coil	200	no oil or fluid present	NA	Dark gray; car battery sized	General Electric/ no PCBs label	WNW of mill building; in the substation adjacent to T10 transformer	Removed from site

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TRANSFORMER/ELECTRICAL EQUIPMENT INVENTORY RECORD

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Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T13	8	Large pad-mounted transformer	200	170	1.36	Light gray; appeared new, @ 6 feet tall	Kuhlman Electric Co./ no PCBs label	NNE of mill building, situated on its own concrete pad with T14 to T16	Left on-site after drained the oil and filled inside chamber with clay absorbent
T14	8	Large pad-mounted transformer	200	170	7.37	Light gray; appeared new, @ 6 feet tall	Kuhlman Electric Co./ no PCBs label	NNE of mill building, situated on its own concrete pad with T13, T15, and T16	Left on-site after drained the oil and filled inside chamber with clay absorbent
T15	8, 9	Large pad-mounted transformer	200	170	4.29	Light gray; appeared new, @ 6 feet tall	Kuhlman Electric Co./ no PCBs label	NNE of mill building, situated on its own concrete pad with T13, T15, and T16	Left on-site after drained the oil and filled inside chamber with clay absorbent
T16	8, 39	Pad-mounted transformer	25	9	ND (1.0)	Dark gray, rusted; appeared old	Westinghouse/ no PCBs label	NNE of mill building, situated on own concrete pad separate but in same fenced enclosure with T13 to T15	Drained of oil and removed from site
T17	10	Pole-mounted transformer	25	est. 10 empty shell	NA	Dark gray; appeared old	Westinghouse/ no PCBs label	NW of mill building, alongside main road on its side still attached to power pole	Lid found open and empty of oil; removed from site
T18	33, D4	Large pad-mounted transformer	unknown	est. 130 empty shell	NA	Dark gray; empty of equipment and oil inside	Spokane Transformer Co./ no PCBs label	NNW of mill building; alongside main road adjacent to maintenance repair shop building foundation pad	Empty shell, left on-site

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Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T19	24, 28, 29, 35	Large pole-mounted transformer	100	44	ND (1.0)	Dark gray, rusted; appeared old	General Electric/ no PCBs label	NW of mill building up on hilltop, adjacent to upper hopper area; on a pole-mounted platform with T20 and T21	Drained of oil before dismounting from platform and removed from site
T20	24, 29	Large pole-mounted transformer	100	44	ND (1.0)	Dark gray, rusted; appeared old	General Electric/ no PCBs label	NW of mill building up on hilltop, adjacent to upper hopper area; on a pole-mounted platform with T19 and T21	Dismounted from platform while filled with oil—spill oil onto ground surface hill slope below; drained remaining oil and removed from site
T21	23, 29, 31	Large pole-mounted transformer	100	44	ND (1.0)	Dark gray, rusted; appeared old	General Electric/ no PCBs label	NW of mill building up on hilltop, adjacent to upper hopper area; on a pole-mounted platform with T20 and T21	Dismounted from platform and toppled crane, spilled oil onto ground surface hill slope below; (assumed transformer to be full—44 gals.); excavated oil-soaked soil; removed soil and transformer from site
T22	D19	Large pad-mounted transformer	200	114	140	Light gray; appeared new; @ 6 feet tall	General Electric/ yellow PCB-contaminated label	Farther NW of mill building, NNW of upper hopper area, and west of silo	Noted minor oil stains on concrete pad beneath bottom valve; drained of PCB-contaminated oil and filled inside chamber of absorbent material

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Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T23	38, D20, D21	Pole-mounted transformer	10	9	NA	Dark gray; appeared old	Westinghouse/ no PCBs label	South of hopper, on its side still attached to power pole on hill slope	OSC noted oil stains on ground surface beneath transformer, but lid was still intact; dismounted from pole, drained of oil, and removed from site
T24	NP	Pole-mounted transformer	25	est. 10; empty shell	NA	Dark gray; appeared old	Westinghouse/ no PCBs label	West of upper hopper area, alongside main road	Removed from site
T25	D22	Pole-mounted transformer	50	34	25.9	Dark gray; appeared old	General Electric/ no PCBs label	Uphill WSW of mill building and south of office/assay building concrete pad, on its side still attached to power pole	No spills or stained soil beneath transformer—found lid still intact; dismounted from pole and found full with oil; drained oil and removed from site
T26	D23	Pole-mounted transformer	75	est. 40	2.03	Dark gray; appeared old	Spokane Transformer Co./ no PCBs label	Uphill WSW of mill building—attached to power pole; appeared to supply power uphill to engineers office	Drained of oil while still on pole; dismounted from pole and removed from site
T27	D24	Pole-mounted transformer	10	11	2.03	Dark gray, rusted; appeared old	General Electric—Spirakore/ no PCBs label	Attached to power pole above pad-mounted transformers T4 to T9, adjacent to dry room	Drained of oil while still on pole; dismounted from pole and removed from site

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TRANSFORMER/ELECTRICAL EQUIPMENT INVENTORY RECORD

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Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T28	D25	Pole-mounted transformer	10	10	2.03	Dark gray, rusted; appeared old	Line Material Co./ no PCBs label	SSW of mill building, attached to power pole above pad-mounted transformers T1 to T3, adjacent to the electrical building	Drained of oil while still on pole; dismounted from pole and removed from site
T29	D26	Oil circuit breaker Type FK-20	unknown	est. 2	ND (1.0)	Dark gray; oil-stained around lid/box	General Electric/ no PCBs label	In lower hopper/large crusher area, on east wall	Drained circuit breaker box of oil; removed the box from site (left the remaining equipment attached to wall)
T30	D26	Oil circuit breaker Type FK-20	unknown	est. 2	ND (1.0)	Dark gray; oil-stained around lid/box	General Electric/ no PCBs label	In lower hopper/large crusher area, on east wall	Drained circuit breaker box of oil; removed the box from site (left the remaining equipment attached to wall)
T31	D26, D27	Oil immersed linestarter	2,200 volts	est. 20	ND (1.0)	Dark gray, rusted; oil-stained around lid/box	Westinghouse/ no PCBs label	In lower hopper/large crusher area, on east wall	Drained equipment box of oil; removed box from site (left the remaining equipment attached to wall)
T32	D26, D27	Shorthead controller	unknown	est. 30	ND (1.0)	Color could not be determined, rusted; appeared old	General Electric/ no PCBs label	In lower hopper/large crusher area, on east wall	Drained equipment box of oil; removed box from site (left the remaining equipment attached to wall)

HERRERA ENVIRONMENTAL CONSULTANTS

TRANSFORMER/ELECTRICAL EQUIPMENT INVENTORY RECORD

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TDD No. 02-10-0006

Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T33	D26	Under-voltage trip switch	unknown	est. 2	ND (1.0)	Dark gray; appeared old	Roller-Smith/ no PCBs label	In lower hopper/large crusher area, on east wall; equipment box located behind switch panel	Drained equipment box of oil; removed box from site (left the remaining equipment attached to wall)
T34	D26, D28	Wall-mounted transformer	2,200 volts (primary); 110 volts (secondary)	est. 5; only est. 0.5 gallon left when found	ND (1.0)	Dark gray, bottom reservoir appeared rusted; appeared old; only 2 inches of oil left in bottom reservoir	Cutler-Hammer/ no PCBs label	In lower hopper/large crusher area, on north wall	Noted oil stains on concrete below transformer (possible some oil spilled into water-filled crusher vault); drained oil from bottom reservoir and left remaining equipment attached to wall
T35	D26, D28	Oil circuit breaker Type FK-20	unknown	est. 2	ND (1.0)	Dark gray, rusted; appeared old	General Electric/ no PCBs label	In lower hopper/large crusher area, on north wall	Drained oil from equipment box and left remaining equipment attached to wall
T36	D26	Switch	unknown	est. 2 empty	NA	Dark gray; appeared old	Roller-Smith/ no PCBs label	In lower hopper/large crusher area, on its side near conveyor belt that leads to secondary crusher building	Equipment box attached behind switch was found empty of oil; left equipment onsite

HERRERA ENVIRONMENTAL CONSULTANTS

TRANSFORMER/ELECTRICAL EQUIPMENT INVENTORY RECORD

Date October 28, 2002
Project Name LEADPT
Project No. C00-01732-032
TDD No. 02-10-0006

Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T37	D31	Transformer	15	est. 20 empty	NA	Color could not be determined, rusted	General Electric/ no PCBs label	WSW of pole-mounted transformers T19 to T21; in vicinity of T38	Inside equipment on ground beside empty shell; possible residual coating of oil in the bottom of the shell; removed shell from site
T38	D32	Capacitor	30	3	NA	Color could not be determined, rusted; appeared old	Cornell-Dubilier Electric Corp./ no PCBs label	WSW of pole-mounted transformers T19 to T21; in vicinity of T37	Drained oil from equipment box and removed from site
T39	D29, D30	Large platform-mounted transformer	75	60	ND (1.0)	Rusted; appeared old	General Electric/ no PCBs label	South downhill of pole-mounted transformers T19 to T21, west uphill from maintenance repair shop concrete pad; on a platform with T40	Noted oil-stained soil beneath transformer; clean-cut power pole near transformer; drained of oil and removed from site
T40	D29, D30	Platform-mounted transformer	75	est. 30	ND (1.0)	Gray; appeared old	Spokane Transformer Co./ no PCBs label	South downhill of pole-mounted transformers T19 to T21, west uphill from maintenance repair shop concrete pad; on a platform with T39	Noted oil-stained soil beneath transformer; clean-cut power pole near transformer; drained of oil and removed from site
T41	NP	Switch	unknown	est. 2; empty	NA	Rusted; appeared old	No manufacturer or PCBs label	WSW of pole-mounted transformers T19 to T21; in vicinity of T37 and T38	Removed box from site

HERRERA ENVIRONMENTAL CONSULTANTS

TRANSFORMER/ELECTRICAL EQUIPMENT INVENTORY RECORD

Date October 28, 2002
Project Name LEADPT
Project No. C00-01732-032
TDD No. 02-10-0006

Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T42	D33	Pole-mounted transformer	25	20	ND (1.0)	Light gray, rusted; appeared old	Allis-Chalmers/ no PCBs label	Est. 0.5 mile uphill, SW of mill site and pole-mounted transformer T26; supplied power to engineers office	Drained of oil while still attached on pole; dismounted and removed from site
T43	D34	Switch for main disc	2,300 volts	est. 6	NA	Dark gray, somewhat rusted; appeared old	Westinghouse/ no PCBs label James G. Murphy, Inc. auctioneer label	NE corner inside mill building, on upper cat walk, north wall	Oil reservoir box located behind switch panel, drained oil from box and removed box from site (left remaining equipment attached to wall)
T44	D34	Circuit breaker for main disc	440 volts	no oil or fluids present	NA	Dark gray, rusted; appeared old	Roller-Smith/ no PCBs label James G. Murphy, Inc. auctioneer label	NE corner inside mill building, on upper cat walk, north wall	Left on-site
T45	D35	Oil circuit breaker Type FK-20—for rod mill disc	unknown	est. 2	NA	Dark gray, rusted; appeared old, noted oil stains around lid/box	General Electric/ no PCBs label	NE corner inside mill building, on upper cat walk, east wall	Drained oil from equipment box and removed box from site (left remaining equipment attached to wall)
T46	D35	Circuit breaker Type F20—for rod mill starter	unknown	est. 2	NA	Dark gray, rusted; appeared old, noted oil stains around lid/box	Allis-Chalmers/ no PCBs label	NE corner inside mill building, on upper cat walk, east wall	Drained oil from equipment box and removed box from site (left remaining equipment attached to wall)

HERRERA ENVIRONMENTAL CONSULTANTS

TRANSFORMER/ELECTRICAL EQUIPMENT INVENTORY RECORD

Date October 28, 2002
Project Name LEADPT
Project No. C00-01732-032
TDD No. 02-10-0006

Transformer ID No.	Photo ID	Type of Electrical Equipment	KVA Power Output	Oil Capacity (gallons)	PCB Content (mg/kg)	Color and Condition (relative age)	Manufacturer/ Labels	Location	Spills/ Additional Information
T47	D36	Capacitor	unknown	3 empty	NA	Rusted; appeared old	Cornell-Dubilier Electric Corp./ no PCBs label	WSW of pole-mounted transformers T19 to T21; in vicinity of T37 and T38	Found during second site sweep during removal—left on-site
T48	NP	Oil circuit breaker (type FK-20) and Switch for regrind starter	unknown	est. 2 (circuit breaker); est. 2 (switch box)	ND (1.0)	Dark gray, rusted; appeared old	General Electric/ no PCBs label	NE corner of mill building, on main floor, north wall	Found on Nov. 2, 2002 after main drum area was cleared (switch panel was somewhat hidden); drained boxes of oil and removed them from site (left remaining equipment attached to wall)

KVA Kilovolt amps.
PCBs Polychlorinated biphenyls.
est. Estimated.
ND (1.0) Constituent not detected above laboratory report limit shown in parentheses.
NA Sample not analyzed for the constituent.
[a] Oil capacity of transformer or electrical equipment was based on information on metal label plate affixed to the side of the equipment or estimated based on visual observations of similar size equipment observed across the site.
NP No photograph available.

Date: 10-28-02

Project Name: LEADPT

TDD Number: TDD-02-10-0006

Electrical Transformers

TIME	MONITORING INSTRUMENT READING*	CONTAINER / DRUM ID	PHOTO ID	CAPACITY (gal)	CONTAINER MATERIAL	CONTAINER COLOR	CONTAINER OPENING TYPE(S) (bung, cap, open, closed)	LABELS / MARKINGS	~~PHASE DESCRIPTION (number of phases, color, consistency, sludge)~~ location	SPILL / LEAKING, APPROXIMATE VOLUME (%), ADDITIONAL INFORMATION (terrain, drainage, pallet, etc.)
~~DRUM~~		T1		~~100~~ KVA	35gals	white	manufacturer - Allis-Chalmers	blue certified label PCB < 50 ppm	SW of mill building	fairly new, on concrete pad
		T2		~~100~~ KVA	unknown cap.	white 35gals	GE Envirotemp transformer fluid	certified PCB < 50 ppm		fairly new on concrete pad
		T3		100 KVA	35gals	white	Allis Chalmers	certified PCB < 5ppm		fairly new on concrete pad.
		T4		5 KVA	unknown cap.	possible gray 1/2gals.		no label Line Material Co.	up on hill - SW of mill building	older transformers
		T5		5 KVA	1/2 gal	gray	1/2gals	no PCB label Line Material Co.		older transformers
		T6		5 KVA	unknown cap.	possible gray		no PCB label Line Material Co.		older transformers
		T7		25 KVA	20gals	gray		blue label within transformer no PCB		
		T8		25 KVA	20gals	gray		no PCB Westinghouse		
		T9		25 KVA	20gals	gray		Westinghouse		
		T10		~~25~~ ? KVA	? cap.	light gray		no label PCB GE Envirotemp	large transformer in substation NW of mill building	has 3 compartments vactruck operator - estimated pumped out 1,200 gallons from all 3 compartments.

* Indicate type and model of monitoring instrument used.

APPENDIX C

OSC Pollution Report

United States Environmental Protection Agency

Region 10 Emergency Response Unit

POLLUTION REPORT

I. HEADING

Date:	13 March 2003
Subject:	Anderson-Calhoun Mill Time-Critical Removal Action
From:	Earl Liverman, OSC, USEPA, Region 10, Emergency Response Unit
Tel:	208/664-4858 or 206/696-3061
TO:	See distribution list

POLREP No. 1 - INITIAL AND FINAL

II. BACKGROUND

Site ID:	9H
EPA ID No:	WAN001002309
Task Order No:	0011
Response Authority:	CERCLA
NPL Status:	Not listed nor proposed for the NPL
State Notification:	State of Washington Department of Ecology
Action Memorandum Status:	Approved 23 September 2002
Removal Start Date:	27 October 2002
Demobilization Date:	2 November 2002
Removal Completion Date:	2 November 2002

III. SITE INFORMATION

A. Incident Category

Fund-lead time-critical removal action at a former open pit lead and zinc mine. The purpose of the action was to: mitigate exposure to mine-waste-contaminated soils; mitigate exposure to PCBs through removal and off-site disposal of transformers and other oil-filled electrical equipment; and mitigate exposure to other potentially hazardous substances through appropriate characterization and disposal.

B. Site Description

1. Site location

The Anderson-Calhoun mine/mill is located near Leadpoint, Stevens County, Washington (48°55'9.84" N, 117°35'28.70" W). The site is an approximate 50-acre former open pit lead and zinc mine and mill owned by Stevens County, Washington.

The Anderson-Calhoun produced between 1948 and 1952. Total production to the end of 1951 was about 100 tons. The Anderson-Calhoun operated as a mine and mill until 1968. Combustion Engineering, Inc., operated the mill from the early to mid-80s to process barite from an out-of-country mine (Canada). Several abandoned buildings remain standing, including the mill building and other mill structures.

The site is generally flat and the surrounding terrain is mountainous. The surrounding area is sparsely populated and land use is predominantly agricultural. There are several permanent and seasonal residences located within 1 to 2 miles of the site. The entire site is accessible to the public.

- **Description of threat**

There have been no previous private or government response actions conducted at the site.

Threats to Public Health or Welfare

The threat of exposure to trespassers and recreationists (hiking, hunting) exists through ingestion and inhalation of the mine waste contaminants (lead and cadmium), PCBs, and other potentially hazardous substances found at and surrounding the mill. The site is not secure and there is widespread evidence of trespass and vandalism.

Threats to the Environment

Ecological receptors could become exposed to site contaminants through direct contact and ingestion of known and unknown substances potentially related and unrelated to mining activities.

C. Preliminary Assessment/Site Inspection Results

2001 Site Investigation

During September 2001, EPA conducted a Site Investigation (SI) of the Anderson-Calhoun Mine/Mill. The investigation included collection of seven surface soil samples within the tailings piles and two stained soil areas, four sediment samples adjacent to the evaporation/settlement ponds and ditch, and one surface water sample from the water-filled lower mine pit. All samples were analyzed for target analyte listed (TAL) metals; four

surface soil samples collected within the two stained areas also were analyzed for pesticides and polychlorinated biphenyls (PCBs). The surface soil data indicate the presence of elevated metal concentrations in surface soils when compared to the following Washington Model Toxics Control Act (MTCA) Cleanup Regulation (Chapter 173-340 WAC) Method A clean-up levels for *Unrestricted Land Uses* and *Industrial Properties.*

Substance	Unrestricted Land Uses	Industrial Properties	Highest Detected Concentrations
Cadmium	20 mg/kg	20 mg/kg	129 mg/kg
Lead	250 mg/kg	1,000 mg/kg	2,190 mg/kg

No pesticides or PCBs were detected in four near-surface soil samples collected within two stained soil areas at the site.

2002 Removal Evaluation

During September 2002, EPA conducted a removal evaluation of the Anderson-Calhoun Mine/Mill. The purpose of the inspection was to determine whether site conditions warrant a removal action. The following factors pertinent to determining the need for such an action were observed:

- Approximately 18 electrical transformers and other oil-filled electrical equipment are located throughout the mill area. One transformer is labeled PCB, several transformers are labeled Non-PCB, and others are unmarked. In most instances, the transformers appear to be intact and contain dielectric fluid. Several transformers are staged on concrete while others are pole-mounted or located on the ground.

  The transformers are suspected of containing PCB-contaminated dielectric fluid at concentrations both greater and less than 50 parts per million (ppm). The Toxic Substances Control Act, 15 U.S.C. § 2610 *et. seq.*, regulatory threshold for PCBs is 50 parts per million (ppm) and the Washington Dangerous Waste Regulations, Ch. 173-303 WAC, regulatory threshold for PCBs is 2 ppm.

- Approximately 100, 55-gallon drums are located throughout the mill area. While several of the drums found out-of-doors appear empty, others are full or partially filled with unknown liquid and/or solid substances. Numerous drums staged within the dilapidated mill building are punctured with bullets and gelatinous or solid materials are spilling from the drums onto the surrounding concrete foundation. Several drums were labeled as containing sodium hydroxide or corrosive. Many of the drums were field tested and displayed corrosive, flammable, and ignitable characteristics.

- A partially filled bunkered storage tank is located near the tailings impoundment. The tank capacity is estimated to be 10,000 gallons and the contents is suspected to be diesel and perhaps other materials.

- The site is not secure and there is widespread evidence of trespass and vandalism and domestic and wild animal movement throughout the site.

  There may be other unknown hazardous substances present at the site because of observed spillage, original container labels are not always present and if present may not accurately reflect contents, disposal records are not known to exist for process and industrial wastes generated at the site, and the site is not secure (illegal disposal may have occurred).

- A wetland complex is located on site. Deer, waterfowl, and amphibians were observed.

IV. RESPONSE INFORMATION

A. Situation

1. Current situation

All response activities are complete.

2. Removal activities to date

Federal (U.S. Fish and Wildlife Service), State (Department of Ecology), and Stevens County personnel were consulted and involved with planning for and implementation of the response activities described below.

A day-by-day chronology of events follows:

09/23/02

EPA approves Action Memorandum to conduct time-critical removal activities at the Anderson-Calhoun Mine/Mill site.

10/24/02

Stevens County Commissioners and Sheriff, Washington State Patrol, and US Border Patrol were briefed on removal activities and proposed schedule.

10/27/02

START and ERRS personnel mobilized to the site to conduct removal activities. Personnel: 1 EPA, 3 START (Herrera) and 7 ERRS (2 EQM and 5 ERI [EQM team subcontractor]). (Note that the USEPA OSC is overseeing both the Anderson-Calhoun and the Bonanza response actions because of the close proximity of the sites to each other.)

Weather: Sunny, 43°F /Clear 19°F

10/28/02

Personnel were familiarized with site features and also reviewed and discussed health and safety issues and the scope of removal activities. Established site control and reviewed standard operating procedures for work. Continued mobilization activities, including arrival of a 14-ton GMC boom truck, Caterpillar 924G front end loader, Genie Z-45 Manlift, and Hitachi Excavator EX225. Conducted site reconnaissance to locate full or partially filled containers. Started inventorying and labeling containers, staging containers and transformers, and hazard categorization and consolidation of container and transformer contents.

An operator failed to place boom truck out-riggers while attempting to remove three transformers from a pole-mounted platform. The truck was inherently unstable and consequently toppled over while removing one of the transformers. No one was injured. (Refer to Section 4 - Transformer Incident, for more detailed accident information.)

Personnel on-site: 1 EPA, 3 START, and 7 ERRS (2 EQM and 5 ERI).

Weather: Sunny, 41°F /Clear 18°F

10/29/02

Started removal of dielectric fluid from transformers and other oil-filled electrical equipment. Continued conducting site reconnaissance, inventorying, labeling, and staging containers and transformers, and hazard categorization and consolidation of container and transformer contents. The area suspected of containing elevated concentrations of Cd and Pb in soil were evaluated using a field portable X-ray fluorsecence (FPXRF) instrument; however, no discernable pattern of contamination was detected.

Personnel on-site: 1 EPA, 3 START, and 6 ERRS.

Weather: Mostly sunny, 31°F /Clear 14°F

10/30/02

Continued removal of dielectric fluid from transformers and other oil-filled electrical equipment. Continued conducting site reconnaissance, inventorying, labeling, and staging containers and transformers, and hazard categorization and consolidation of container and transformer contents.

Personnel on-site: 1 EPA, 3 START, 6 ERRS.

Weather: Mostly sunny, 29°F /Clear 12°F

10/31/02

Continued conducting site reconnaissance, inventorying, labeling, and staging containers and transformers, and hazard categorization and consolidation of container and transformer contents. Started off-site transport of wastes for disposal.

Personnel on-site: 1 EPA, 3 START, 6 ERRS.

Weather: Sunny, 28°F /Clear 8°F

11/01/02

Continued site reconnaissance and consolidation of wastes and off-site transport of wastes for disposal. The site reconnaissance revealed an assay laboratory disposal dump suspected to be associated with the site because of discarded invoices labeled "Calhoun Mine" found scattered among the debris. Completed hazard categorization and packaging of assay wastes for disposal.

Personnel on-site: 1 EPA, 1 START, 6 EQM.

Weather: Sunny, 31°F /Clear 15°F.

11/02/02

Completed consolidation and packaging of all hazardous wastes and transformer carcasses for off-site transport for disposal. EPA, START, and EQM demobilized from the site.

Personnel on-site: 1 EPA, 1 START, 6 EQM.

Weather: Sunny, 30°F.

3. Enforcement

ORC is continuing to investigate the potential for cost recovery from one or more PRPs.

4. Transformer Incident

Late during the afternoon of 28 October 2002 an equipment operator failed to place boom truck out-riggers while removing one of three transformers from a pole-mounted platform. The truck was consequently inherently unstable and toppled over causing the release of approximately 44 gallons of suspected PCB-contaminated oil to the ground from the transformer labeled T21. No one was injured.

At the same time when the OSC and START were being notified of the incident by the ERRS supervisor early the following morning, the OSC observed a small release of oil (likely less than 2 gallons) occurring from one of the other pole-mounted transformers (T20) while it was being removed from the pole-mounted platform. Further removal was immediately suspended pending investigation of both releases and development of a revised transformer pole and platform dismounting procedure.

The ERRS supervisor was relieved of his responsibilities because of his failure to implement worker safety and vehicle operation procedures and was replaced by a more competent and capable supervisor. Site-specific worker safety and equipment operation practices and procedures were again reviewed with all response personnel and a revised work plan was implemented to drain oil from all remaining pole- and platform-mounted transformers before dismount. At the same time, a plan was developed for the excavation of transformer oil contaminated soils. Approximately 10 cubic yards of visually oil-contaminated soil was excavated and samples of residual oil from transformers T20 and T21 (and the third platform transformer T19) along with a confirmation soil sample collected from the excavated area were collected and submitted for analysis. The excavated area was subsequently backfilled with clean soil and graded to existing slope conditions.

Analytical results for transformer oil samples T19, T20, and T21 revealed no PCBs detected above the laboratory reporting limit of 1.0 part per million (ppm). Analytical results for the confirmation soil sample, which was analyzed for PCBs and total petroleum hydrocarbons in diesel and the heavier-than-diesel range, revealed no PCBs detected above the laboratory reporting limit of 0.05 ppm and no diesel-, mineral oil-, or lube oil-range hydrocarbons were detected above their respective laboratory detection limits of 10.0, 25.0, and 25.0 ppm.

B. Planned Removal Activities

There are no planned activities; all response activities required by the Action Memorandum are complete. However, further site investigation is recommended, as described below (refer to Section D - Key Issues).

C. Next Steps

None.

D. Key Issues

The site should be considered for further evaluation to assess the potential nature and extent of contamination at the following locations:

- Areas previously identified during the EPA 2001 site investigation such as the evaporation/settlement pond and tailings piles; beneath and near all ground transformers and associated pads with PCB concentrations greater than 1 ppm; assay lab dump and debris pile; and oil-stained area southeast of the mill building near the former empty drum stockpile.
- Sediment and surface water in wetlands and other surface water features such as the North Fork Deep Creek, drainage ditches, and water-filled mine pits.
- Subsurface soil and groundwater associated with the bunkered tank.
- Several white crystalline waste piles and similar material found within the silo.

There are also numerous human health-related physical hazards associated with unrestricted access to the site such as the water-filled mine pits and dilapidated buildings. Therefore, recommend that the current owner should take whatever precautions deemed appropriate to protect the public against such hazards.

V. COST INFORMATION

	Estimated CostsTo Date
EPA	$8,175
EERS	$109,000
START	$43,000
TOTAL	$160,175

Note: The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

VI. DISPOSITION OF WASTES

Wastestream	Medium	Quantity	Containment	Treatment	Disposal
Acid	Liquid	50 gals	Overpacked	Neutralization	Burlington Environmental, Kent, WA
Corrosives	Liquid	3,250 gals	Overpacked	Neutralization	Burlington Environmental, Kent, WA
Corrosives	Solid	3,000 lbs	Overpacked	Neutralization	Burlington Environmental, Kent, WA
Flammable Liquids	Liquid/Sludge	7,600 gals	Bulked/Over-packed	Incinerated	Burlington Environmental, Kent, WA
PCBs	Contaminated Soil	10 cy	Roll-off Container	Landfill	Chemical Waste Management, Arlington, OR
PCBs	Liquid	115 gals	Bulked	Incinerated	Burlington Environmental, Kent, WA
Transformer Carcasses	Solid	16,535 lbs	Containment boxes	Recycled	Burlington Environmental, Kent, WA
Lead Acid Batteries	Solid	80 lbs	Pallet	Neutralization	Burlington Environmental, Kent, WA
Non-hazardous debris	Solid	28,280 lbs	Bulked	Landfill	Chemical Waste Management, Arlington, OR
Non-hazardous debris	Solid	300 lbs	Containment Box/Over-packed	Landfill	Chemical Waste Management, Arlington, OR

VII. DISTRIBUTION

EPA HQ, Attn: Terry Eby
EPA/Region 10/ECL/ERU
EPA/Region 10/WOO, Attn: Tom Eaton
Ecology, Attn: Flora Goldstein
Herrera, Attn: P. Fedirchuk
EQM, Attn: Jason Coury